City+2025@Oxford:
The 8th International Conference on Interdisciplinary Urban Studies

Urban Data Analytics and the Polycrisis

September 29-30, 2025
University of Oxford, The United Kingdom

Conference Programme

Organisers

City+

School of Geography and the Environment, University of Oxford

Transport Studies Unit, University of Oxford

Supported by

Association for European Transport

China Institute of Urbanisation, Zhejiang University

Chinese Economic Association (CEA) UK/Europe

Elsevier

Inclusive and Smart Urban-Rural Governance Lab, Zhejiang University

Leverhulme Centre for Demographic Science, University of Oxford

Mobility and Urban Systems Analytics Lab, University College London

World Urban Planning Education Network (WUPEN)

ZJU-CMZJ Joint Lab on Data Intelligence and Urban Future, Zhejiang University

Content

1. General Information

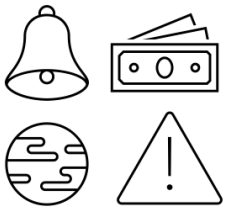
City+ is organising annual international conferences on interdisciplinary urban studies. The first event was City+2017 at University of Cambridge, followed by City+2018 at University College London, City+2019 at Delft University of Technology, City+2021 at Polytechnic University of Milan, City+2022 at Australian National University, City+2023 at Curtin University and City+2024 at University of Kitakyushu. To date, our conferences have already attracted more than eight hundred delegates from many leading universities and institutes around the world. It has demonstrated its potential to be a good platform for sharing research experiences and thinking, developing cooperation opportunities, and addressing urban concerns from an interdisciplinary perspective.

The City+2025@Oxford is held in September by the School of Geography and the Environment, University of Oxford, a prestigious university globally renowned for its excellence and strong industry-academia-research partnerships in fields of urban and environmental studies. We hope that City+2025@Oxford can facilitate researchers to work closely at the forefront of interdisciplinary urban studies through disseminating their research, receiving valuable feedback, expanding academic networks, and boosting potential collaborations.

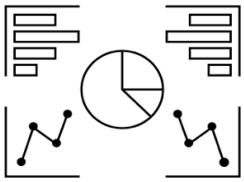
Note: The word cloud is generated based on the abstracts submitted by the presenters.

1.1. Conference Theme

The general theme of the City+2025@Oxford conference is "Urban Data Analytics and the Polycrisis". We have three highlights:



The world's cities are increasingly at the forefront of a complex and interconnected web of challenges—known as the polycrisis. Climate change, economic instability, rapid urbanisation, public health crises, and geopolitical tensions interact in ways that amplify their individual impacts, leaving urban areas particularly vulnerable.



This conference delves into the pivotal role of data analytics in addressing interconnected crises, equipping attendees with the skills to effectively manage and utilise data. By leveraging the power of big data, machine learning, and predictive modelling, we can uncover patterns, assess risks, and develop informed strategies to mitigate future challenges.

Urban centres are not only hubs of opportunities but also the epicentres of vulnerabilities. To build resilient, adaptive cities, we need more robust, actionable data. This event brings together PhD students, leading experts, policymakers, researchers, and industry practitioners to discuss cutting-edge data-driven strategies for academic research, urban resilience, innovation, and equity in the face of the polycrisis.

Keywords

Polycrisis | Urban Data Analytics | Resilience | Smart Cities | Public Policy | Climate Adaptation | Equity

Specifically, there are four conference themes:

Theme 1: Climate change, food, and natural resources
Theme 2: Finance, housing, and inequality
Theme 3: Spatial demography, labour dynamics, and migration
Theme 4: Transport system and spatial economy

1.2. Organising Institutes

- City+
- School of Geography and the Environment, University of Oxford
- Transport Studies Unit, University of Oxford

1.3. Supporting Institutes

- Association for European Transport
- China Institute of Urbanisation, Zhejiang University
- Chinese Economic Association (CEA) UK/Europe
- Elsevier
- Inclusive and Smart Urban-Rural Governance Lab, Zhejiang University
- Leverhulme Centre for Demographic Science, University of Oxford
- Mobility and Urban Systems Analytics Lab, University College London
- World Urban Planning Education Network (WUPEN)
- ZJU-CMZJ Joint Lab on Data Intelligence and Urban Future, Zhejiang University

1.4. Supporting Journals

- City and Built Environment (Springer Nature)
- Frontiers of Urban and Rural Planning (Springer Nature)
- Journal of Urban Mobility (Elsevier)
- Structural Change and Economic Dynamics (Elsevier)
- Transactions in Urban Data, Science, and Technology (Sage)

1.5. Contact Information

Xiaohongshu: 5049418472
X: City+ (@CityPlusNetwork)
Website: https://www.city-plus.org/
WeChat public account: CityPlus2016
LinkedIn: https://www.linkedin.com/company/cityplus2016-network

1.6. Call for Hosting Future City+ Conferences

If you are interested in hosting a City+ Conference in 2027 or beyond, please contact Dr. Yongping Zhang at zhangyongping2112@gmail.com or talk to him directly during the Oxford conference. Basically, the potential host should be a faculty member at an urban-related department, ideally from a university outside Mainland China. You may get relevant information from here: https://mp.weixin.qq.com/s/lOupxcK6oOcIa9QaFCfPTQ.

2. Presentation Guidelines

2.1. Presentation Details

Please note that each presentation is strictly limited to 15 minutes. We recommend planning 12 minutes for your presentation and 2-3 minutes for Q&A. Your session chair might contact you for further details. Please react responsively and let them know if you have any questions.

2.2. Online Presentation

We will use Microsoft Teams to host the online presentations. Please click the link for your assigned venue, enter your name and email address, and you will receive an automatic confirmation email with access details for the meeting.

Lecture Theatre:
https://events.teams.microsoft.com/event/b48b9574-99c4-48d4-baae-8be921db1f85@cc95de1b-97f5-4f93-b4ba-fe68b852cf91

Place Suite:
https://events.teams.microsoft.com/event/d48ea186-fce3-4ede-a99c-3d5d8920b06a@cc95de1b-97f5-4f93-b4ba-fe68b852cf91

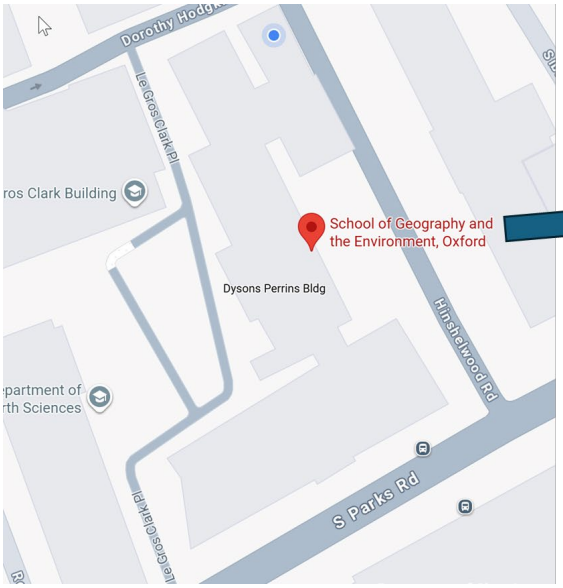
Atmosphere Room:
https://events.teams.microsoft.com/event/5862fd24-fd09-4007-8a2e-acc5ace9cec1@cc95de1b-97f5-4f93-b4ba-fe68b852cf91

Desert Room:
https://events.teams.microsoft.com/event/2e1751fc-ea45-41c0-87c2-92ab5fa6f2f0@cc95de1b-97f5-4f93-b4ba-fe68b852cf91

2. Presentation Guidelines

2.3. Venue

Please enter the venue, School of Geography and the Environment, Oxford University from the front gate (picture below). You will then be directed to the reception or conference rooms from there.



2.4. Food and Drink

Refreshments and lunch will be served in Place Suite. But as Place Suite is only able to accommodate no more than 60 people, we would ask you to move to other rooms to consume the food and make room for others who have not been served yet. Please note that no food or drink is allowed in Lecture Theatre, while you can have them in the other 3 rooms. Please keep the venue clean and everything in their original positions after you leave the room.

2.5. Awards and Assessment

We invite and encourage ever audience to assess presentations in sessions they attend using the following form: https://forms.gle/hotp5QWd1rgH3eZw8. The assessment criteria are provided within the form. A number of awards will be presented at the end of the conference based on these assessments.

2. Presentation Guidelines

2.6. Photo and Recording Terms

Please be kindly advised that all presentations, keynote speeches and workshops will be recorded and live streamed. A conference photographer will also be taking photos throughout the event, and these photos will be shared with all participants afterward. If you prefer that your presentation not be recorded or live-streamed, or if you do not wish to be photographed or have your photo shared, please kindly inform us in advance. Additionally, if you do not wish to appear on camera, please refrain from interacting with presenters during the sessions.

2.7. Call for Interest for a Special Issue

There is a possibility that papers based on presentations in this conference will be published in a special issue (SI) in collaboration with Elsevier (the journal still undetermined). As a guide a SI usually requires around 10 full papers. If you are interested in developing a full paper to be published in this SI, we would kindly ask you to fill in the following form https://forms.gle/GFHk1piWfDBJcrmj9.

2.8. Conference Emergency

In the event of an emergency (e.g., fire or earthquake), please follow the instructions and evacuate the venue in an orderly manner. A designated first aider (Alice Jardine, DPhil student) will be on standby. Please notify the nearest staff member if you require first aid.

3. Conference Schedule

	September 29th			
8:00 8:30	Reception (Atmosphere Room)			
9:00	Coffee Break (Place Suite)			
9:30 10:30	Opening Panel Discussion with Prof. Melinda Mills and Prof. Tim Schwanen, moderated by Xiang Ao (Lecture Theatre)			
10:45	Group Photo (Lecture Theatre) and Coffee Break (Place Suite)			
11:00 11:30 12:00	Resilience and Extreme Events in Mobility Systems (Atmosphere Room)	Lunch Preparation (Place Suite)	Critical Examination and Application of Smart Cities (Desert Room)	AI and Extreme Weather Events (Lecture Theatre)
12:30 13:00	Lunch Break (Place Suite)			
13:30 14:00 14:30	Infrastructure, Connectivity, and Spatial Economics (Atmosphere Room)	Governance, Planning, and International Perspectives (Place Suite)	Data-driven Methods for Urban Issues (Online and Desert Room)	Production of Space and Urban Justice (Lecture Theatre)
15:00	Coffee Break (Place Suite)			
15:30 16:00 16:30	Multi-system Analysis for Climate (Atmosphere Room)	Mobility Equity and Accessibility (Place Suite)	Smart and Inclusive Urban Futures (Online and Desert Room)	Accessibility, Mobility, and Travel Behaviours (Lecture Theatre)
17:00	Coffee Break (Place Suite)			
17:30	Plenary Keynote Speech by Prof. Danny Dorling (Lecture Theatre)			
18:15	Plenary Keynote Speech by Prof. Benjamin Büttner (Lecture Theatre)			
19:00	15min Q&A (Lecture Theatre)			
19:15				
19:30 20:00 20:30 21:00 21:30	Formal Dinner (Mansfield College)			

	September 30th			
9:00 9:30 10:00	Addressing Urban Issues with Urban Data (Atmosphere Room)	Social and Spatial Inequality (Place Suite)	Urban Resilience (Online and Desert Room)	Methods and Models in Urban Transport Research (Lecture Theatre)
10:30	Coffee break (Place Suite)			
11:00 11:30 12:00	Urban Policy for the Future (Atmosphere Room)	Urban Design and Urbanism (Online and Place Suite)	Spatial Perception and Urban Experiences (Desert Room)	Spatial Analysis for Sustainable Cities (Lecture Theatre)
12:30 13:00	Lunch break (Place Suite)			
13:30 14:00 14:30	Urban Fragility and Resilience (Atmosphere Room)	Urban Green Space (Place Suite)	Applied Urban Data Analytics (Online and Desert Room)	Demography and Migration (Lecture Theatre)
15:00	Coffee break (Place Suite)			
15:30 16:00 16:30	Workshop Robustipy led by Charlie and Dan (Atmosphere Room)	Workshop Mapineq led by Wenlan, Doug and Xiang (Place Suite)	Workshop Spatial Econometrics led by Dasom and Yan (Desert Room)	Elsevier Publication Workshop led by Zhifu, Zara, Jess, and Sam (Lecture Theatre)
17:00	Coffee break (Place Suite)			
17:15	Keynote Speech by Prof. Zhifu Mi (Lecture Theatre)			
18:00	Closing Speech by Prof. Thanasis Kizos (Lecture Theatre)			
18:45	15min Q&A (Lecture Theatre)			
19:00	The Award and Closing Ceremony (Lecture Theatre)			
19:30				

4. Session Agenda (29 Sep 11:00–12:30)

Session 1 AI and Extreme Weather Events

Time: 29 September, 11:00 - 12:30
Venue: Lecture Theatre
Session Chair: Nan Bai (Delft University of Technology)

ID	Title	Author
28	GeoAI Empowers Resilient City Construction: An Intelligent Urban Flood Modeling Framework Considering Composite Geographic Features	Hengxu Jin, Shuliang Zhang, Reinhard Hinkelmann
80	Deep Learning for Decoding Compound Risks: Climate-Urbanization Synergies in Flood Susceptibility Forecasting Under SSP-RCP Scenarios in Beijing, China	Tianlian Wang, Zhe Li
116	Spatiotemporal Modelling of Flood Risk using Building-Level Data: The Case of North Jakarta	Zahratu Shabrina, Jin Rui, Emma Colven
141	Two Data-Driven Intelligent Frameworks for Building Energy Consumption and Indoor Environment Prediction Tasks in Urban Crisis Management	Ben Jiang, Tianyi Zhao
144	Urban Planning Priorities Analysis Based on Urban Heat Risk Supply - Demand Mismatch: A Case Study of Hangzhou, China	Congyue Zhou, Huan Chen
177	Nonlinear Modelling and Long-term Flood Risk Prediction in Jakarta Based on XGBoost and SHAP: A Multi-source Data-driven Study of Hazard Mechanisms and Trend Evolution	Jin Rui, Zahratu Shabrina, Emma Colven

Session 2 Critical Examination and Application of Smart Cities

Time: 29 September, 11:00 - 12:30
Venue: Desert Room
Session Chair: Yue Yin (University of Oxford)

ID	Title	Author
77	Mapping Data Sources and Types for the SCORELINE Method in Urban Open Space Quality Assessment	Milena Vukmirovic, Miroslava Raspopovic, Jovana Jovic
97	Leveraging LLMs in Analysis of Public Feedback on Smart City Infrastructure: A Case Study of Shanghai	Zhaowen Deng, Lili Lin
107	The Transition of Automated Mobilities in New Zealand	Moayad Shammut, Muhammad Imran
139	Research on Smart City Governance Mechanism Under the Threshold of Digital Twin Driving: Practical Exploration Based on Data Integration and Institutional Synergy in Zhengzhou City	Xiangyu He
158	Smart and Healthy Lighting for Urban Children: Data-Driven Strategies for Resilient Home Learning Spaces	Quanlong Liu, Mengqiu Cao, Yuhong Wang
186	Paradigm Shift in Resilient Governance for Smart City Development: An Integrated Synergy-Resilience Framework	Ben Hao

4. Session Agenda (29 Sep 11:00–12:30)

Session 3 Resilience and Extreme Events in Mobility Systems

Time: 29 September, 11:00 - 12:30
Venue: Atmosphere Room
Session Chair: Mengqiu Cao (University College London)

ID	Title	Author
7	All Roads Lead to Rome: The Role of Road Networks in the Economic Resilience of Cities	Yujing Yang, Nicholas Horsewood
30	Extreme Weather Events and Traffic Disruptions: A Modelling Framework for Resilience Policy Design With a Case Study	Pietro Mariano, Francesco Guglielmi, Pierluigi Coppola
70	Unravelling Economic-Spatial Interaction in Urban Agglomerations: A Network Analysis of the Yangtze River Delta	Bohao Su
95	Transport Infrastructure and Economic Resilience in Jakarta, Indonesia: The Cobb–Douglas Production Function Analysis Amid Polycrisis	Hansha Devi Kistamah
181	Urban Mobility Management in Response to Disasters: A Social Cybernetics Perspective	Jian Li
196	Impact of Climate-Induced Disturbances on the Resilience of Urban Road Transport Systems	Mohammad Sharif, Dirk Wittowsky

4. Session Agenda (29 Sep 13:30–15:00)

Session 4 Data-driven Methods for Urban Issues (Online)

Time: 29 September, 13:30 - 15:00
Venue: Online and Desert Room
Session Chair: Clive Parkinson (University of Oxford)

ID	Title	Author
55	Mapping Knowledge: Fuzzy Cognitive Maps as Participatory Urban Data in Nagaland, India	Thejangunuo Keretsu, Arvind Lakshmisha, Harini Nagendra
56	Urban Planning for Social Resilience: The Role of Urban Structure in Mitigating Social Conflict Amid Food Price Volatility in Sub-Saharan Africa	Anbang Xie
58	What Is the Interplay Between Artificial Intelligence (AI) and Low-Carbon City (LCC) Development?	Xingchen Lai, Yuxin Zhang, Hiroatsu Fukuda
108	Understanding Fear of Crime in Macau: A Two-Study Approach on Vulnerability, Past Victimization, and Neighborhood Disorder	Liangliang Rong, Pengjie Ju, Kehui Wu, Lixia Peng
127	A Room of Her Own? Housing Crowding and Gendered Educational Outcomes in China	Yiqi Huang, Shizhen Wang, Yuhong Wang
160	SCORE: Smart Cities' Organizational Readiness Evaluation for Urban Planning Transformation	Amay Arora

Session 5 Governance, Planning, and International Perspectives

Time: 29 September, 13:30 - 15:00
Venue: Place Suite
Session Chair: Nicholas Chow (University of Oxford)

ID	Title	Author
16	Governance of Municipal Solid Waste in Developing Countries: Insights From Three Bangladeshi Cities	Shahana Akther
103	Methods for the Numerical Evaluation of Deliberative Processes: A Dynamic Model for Capturing Preference Reversals	John Buckell, Thomas Hancock
121	How Can Citizen-Generated Data Enhance the Capabilities of Environmental Policy Analysis? A Case Study of Urban Water Environment Data Analysis Using the BERT Pre-Trained Model	Jingjing Cai, Hongchuan Wang
150	Multiple Crises Driven by Rare Earth Supply Chains: Synergistic Governance Pathways for Climate Change, Biodiversity Loss, and Resource Equity	Xuanru Zhou, Gengyuan Liu
187	The Era's Mission of Metropolitan Area Governance: A Review of Experiences in China's Metropolitan Areas	Lin Tian, Shangwu Zhang
197	When Green Meets Bureaucracy: Institutional Logics, Fragmented Authority, and the Governance of Sustainable Finance in Indonesia	Fauziah Yuniarti

4. Session Agenda (29 Sep 13:30–15:00)

Session 6 Infrastructure, Connectivity, and Spatial Economics

Time: 29 September, 13:30 - 15:00
Venue: Atmosphere Room
Session Chair: Camila Ramos (University of Oxford)

ID	Title	Author
61	Underground Humanity: On the Electrification of the London Underground and Its Impacts	Yanwen Liao
68	Transportation Evolution and Spatial Economic Restructuring: A Spatiotemporal Analysis of the Chengdu-Chongqing Highway's Impact (1930s–1940s)	Qinya Huang
124	Research on the Impact of Differentiated Supply of Industrial Land in China on Total Factor Productivity and Its Spatiotemporal Heterogeneity	Jian Wang, Yun Li, Haixia Wei, Qun Wu
133	The Spatially Differentiated Impact of High-Speed Railway on Accessibility and Socio-Economic Development of Developing Regions: A Study in Southwest China	Rui Zhou
202	The Impact of Built Environment on Shared Bicycle Route Choice in Metro Travel: A Case Study of Shenzhen	Jinyi Yu
220	Exploring the Impact of Cycling Infrastructure on Property Price in Shenzhen	Zhaoqi Zhou, Tim Schwanen

Session 7 Production of Space and Urban Justice

Time: 29 September, 13:30 - 15:00
Venue: Lecture Theatre
Session Chair: Yi Fan Liu (University of Oxford)

ID	Title	Author
92	Understanding the Financed Whole Life Carbon Emissions: GHGs Emissions Associated With Residential Mortgage Loans in Hong Kong From 2000 to 2020	Liang Dong
105	Obedient Communities and Urban Erasures: Everyday Urbanism in Taipei's Military Dependents' Villages Under Financialised De-Militarisation	Yu-Tung Wu, Stephen Hincks, Ryan Powell
110	Equity-Focused Evaluation of Urban Heat Mitigation Policies: Evidence From Housing-Related Exposure in Phoenix, USA	Wensen Luo, Qian Shi, Chao Xiao, Xingzi Zhang
119	People as Spectacle: A Case Study of Downtown Cairo	Lojine Hanoun
194	High-Resolution Mapping of Material Stocks in the Urban Built Environment in China	Zhenfeng Shao, Bowen Cai, Xiaoyu Zheng, Xiongjie Deng
198	Last to Own, First to Pay: Rising Housing Costs Across Population and Neighborhoods in Germany	Oana Garbasevschi, Andreas Peichl, Hannes Taubenböck

4. Session Agenda (29 Sep 15:30–17:00)

Session 8 Accessibility, Mobility, and Travel behaviours

Time: 29 September, 15.30-17.00
Venue: Lecture Theatre
Session Chair: Xiang Ao (University of Oxford)

ID	Title	Author
66	Understanding Phenomenon of Weak Emergence in Complex Adaptive Systems Through GPS Bus Data	Rati Sandeep Choudhari
85	Inclusive Proximity: A Perceived Walkable Neighborhood Framework to Analyze the 15-Minute City	Janus Leonhardt, Ricardo Hurtubia
163	EV vs ICEV Users: A Multilevel Comparison of Travel Behaviour	Hao Zhang
203	Exploring the Potential of Large Language Models (LLMs) in Analyzing Passengers' Perceptions of Transit Service Quality	Shuli Luo, Ying He
205	The Relationship Between Active Travel and Green Spaces: A Case Study of Shanghai	Jinjing Hu
208	Perceived Safety in Shared Micromobility: A Multi-City Analysis of User Concerns and Behavioral Implications	Rosalia Camporeale, Vincenza Torrisi, Pengxiang Zhao, Chunli Zhao

Session 9 Mobility Equity and Accessibility

Time: 29 September, 15:30 - 17:00
Venue: Place Suite
Session Chair: Sieun Lee (University of Oxford)

ID	Title	Author
23	Drivers and Barriers to Equitable and Sustainable Mobility in Latin America: The Case of Lima and Santiago	Andrea Costa-Allendes
44	Scaling Effects of Intra-City Human Mobility Resilience Patterns Under Extreme Weather	Yan Zhang
45	A Theoretical Framework for Transport Accessibility Thresholds Informed by the Capabilities Approach	Camila Ramos, Tim Schwanen
120	Assessing the Impacts of On-Demand Transit on Urban Mobility and Equity: A Study of Hong Kong	Xiaohang RUAN
161	Causal Inference and Machine Learning Synergy: Mobile Signaling Big Data Unveils Built Environment Heterogeneity in Older Adults' Post-COVID-19 Walking Resilience	Chengcheng Liu
174	Is Existing Enough? Spatial Inequalities in Accessing Public Transportation Services: An Analysis on Ataşehir, Istanbul	Cansu Çiçek Aydın, Fatih Terzi

4. Session Agenda (29 Sep 15:30–17:00)

Session 10 Smart and Inclusive Urban Futures (Online)

Time: 29 September, 15.30-17.00
Venue: Online and Desert Room
Session Chair: Junior Mbangala (University of Oxford)

ID	Title	Author
21	Toward the Neuro-Comfortable City: Neurodiversity, Public Urban Spaces, and Digital Neuro-Urban Acupuncture	Charles Josefson
57	Multi-Level Coupling and Coordination Status and Development Trend of the "Smart City Urbanization Low-Carbon City" System	Yuxin Zhang, Xingchen Lai, Hiroatsu Fukuda
79	Cities, Crises, and Climate Change: Analysing Delhi as a Polycrisis — Sarnath Banerjee's All Quiet in Vikaspuri Through the Lens of Ecology and Historiography	Jaya Yadav
104	Forging Connections in Integrated Planning: Reflections From a European Experiment	Dionisia Koutsi, Yannis Paraskevopoulos, Ioannis Chatziioannou, Stefanos Tsigdinos, Sofia Tsadari, Evgeniya Bobkova, Ioanna Stavroulaki, Mariam Shulqami, Nadia Charalampous, Efthimios Bakogiannis, Thanos Vlastos
142	Living Experience in the Silicon Alley Model Neighborhood from an Inclusive Perspective: Analyzing Driving Factors of Living Experience in Silicon Alley Using the LDA-DEMATEL Method	Junqing Zhu, Chenshu Liu
166	Providing Mechanistic Understanding for Digital Twins: An LSTM-Based Approach to Recognizing Urban Functional Zones in High-Density City	Heng Zhang

Session 11 Multi-system Analysis for Climate

Time: 29 September, 15.30-17.00
Venue: Atmosphere Room
Session Chair: Lena Easton-Calabria (University of Oxford)

ID	Title	Author
20	Nature-Based Solutions for Urban Heat Islands in Megacities: A Case Study of Shenzhen, China	Ying Zheng
64	Towards Polycrisis Resilience: A Social-Ecological-Technical Systems Approach to Urban Resilience Mechanisms	Yiqing Liu, Kedi Hu, Yiqun Han
87	Heat Stress Adaptation in Urban Slums of Bangladesh: Conditions Shaping Individual and Community Responses	Zakia Sultana, Heleen L. P. Mees, Bishawjit Mallick
106	Re-Imaging Beijing's Urban Wetland Through 1110 Years of Transformation	Zhuhui Bai
151	Resilience in the Face of Polycrisis: Multi-Source Integration Analysis and Dynamic Adaptation Pathways of Cultural Route Node Cities in Europe	Kedi Hu, Yiqing Liu, Yiqun Han
175	Urban Vulnerability Assessment in China's Coastal Zones: A Water-Heat-Biodiversity Nexus Perspective	Chengwei Li, Xiangrong Wang, ChengHe Guan

4. Session Agenda (30 Sep 9:00–10:30)

Session 12 Addressing Urban Issues with Urban Data

Time: 30 September, 9:00 - 10:30
Venue: Atmosphere Room
Session Chair: Shan Yu (University of Oxford)

ID	Title	Author
75	Children in Urban Violent Conflicts: Subnational Population Mapping in 99 Countries Across the Globe	Aubrey Steingraber, Natalia Tejedor-Garavito
82	Mismatch of Social Inclusion and Street Space Quality: Characteristics, Mechanisms, and Implications	Yujin Huang, Guodong Fang, Jinming Yan, Liang Dong
118	Quantifying Housing Market Stress From Short-Term Rentals: Composite and Bayesian Indicators for Cornwall	Francesco Viviani, Zahratu Shabrina
148	The Associations Between Neighbourhood Type, Neighbourhood Built Environment, and Overweight: Evidence From China	Mingjie Sheng, Wen Jiang
164	Impact of Courtyard Wind Environment Types on Indoor Ventilation Performance: A Case Study of Traditional Vernacular Residences in Coastal China	Yiying Zhu, Weijun Gao, Dewancker Bart, Kaixuan Chen
172	Multi-Agent Proximal Policy Optimization for Labour Market Dynamics	Lina Waqfi, Bilal Farooq, Zachary Patterson

Session 13 Methods and Models in Urban Transport Research

Time: 30 September, 9:00 - 10:30
Venue: Lecture Theatre
Session Chair: Thomas Hancock (University of Leeds)

ID	Title	Author
15	Predicting Urban Vitality and Pedestrian Road Safety in Urban Areas Based on Machine Learning	Weijie Qiao, Hao Zheng
43	Form, Function, and Equity in the Urban Carbon Cycle: A Comparative Study of Local Climate Zones, Net Primary Production, and Socioeconomic Impacts in Cook County, IL, and Singapore	Jiajia Wang, Yixin Wu
94	Understanding Mobility Modes: The Effect of Quantitative Evaluation “Urban Intervention” on Urban Performance — Urban Interaction Simulation Platform Application on Environment Behavior Testing in Public Spaces	Chen Cui
109	Exploring a Mixed-Experts GeoAI Framework for Implementing Land Value Capture in TOD: A Case Study of Muscat	Humaid Alrashdi, Guoqiang Shen
115	AI-Powered Assessment of Streetscape Quality Related to Pedestrian Crashes	Huan Zhou, Qingbin Cui
167	Constructing an Agent-Based Model of Retail Centres: Exploring Retail Competition and Consumer Behaviour	Akos Balog, Gabriele Filomena, Ron Mahabir, Les Dolega

4. Session Agenda (30 Sep 9:00–10:30)

Session 14 Social and Spatial Inequality

Time: 30 September, 9:00 - 10:30
Venue: Place Suite
Session Chair: Zhaoqi Zhou (University of Oxford)

ID	Title	Author
17	Access to Green Electricity in Africa's Rural Areas	Junior Mbangala, Mapapa Augustin Mbangala
39	Mobile Internet Connectivity and Household Wealth in the Philippines	Zhiwu Wei, Neil Lee, Yohan Iddawela
46	The Relationship Between Participation Frequency Among the Elderly and Accessibility of Mutual-Aid Elderly Care Facilities: Evidence From Peri-Urban Villages in Shanghai	Xin Ma, Tetsuya Yaguchi
53	Rural Public Transport Disparities in Major Chinese Cities: A Barrier to SDG Achievement	Bingzhi Liu, Zihua Chen, Zhenbo Wang
114	Rethinking the Escalator Effect: Birthplace and Parental Employment in Chinese Migration	Lingyan Li
131	Constructing Index for the Assessment of Urban Residential Land Efficiency Using Location-Based Big Data	Yuan Yuan, Han Mu

Session 15 Urban Resilience (Online)

Time: 30 September, 9:00 - 10:30
Venue: Online and Desert Room
Session Chair: Fred Sanders (Delft University of Technology)

ID	Title	Author
33	Compounding Effects and Recovery Challenges From Sequential Floods in the Southern U.S.	Yang Yang, Haoying Han, Chao Fan
65	Drivers and Mechanisms of Border Development: Insights from Border Regions	Yuchen Zhang, Bart Dewancker, Zhengli Mao
78	Imperfect but Adaptive: Spatial Analysis for Urban Risk Identification Under Data Constraints	Wanbo Liu
169	Disaster Resilience and Sustainable Value of the Lougang Polder System: A Spatiotemporal Analysis of Floods and Droughts in the Taihu Basin During the Ming and Qing Dynasties	Huanjie Liu, Pesoa Marcilla Melisa, Rui Zhang, Yukun Zhang
170	Climate Adaptation and Spatial Resilience in Highland Settlements: A Case Study of Tibetan Tribal Systems in the Hehuang Region	Weijia Li, Pesoa Marcilla Melisa
204	Study on the Spatiotemporal Evolution and Driving Factors of Urban Resilience in China	Gang Deng, Rui Wang

4. Session Agenda (30 Sep 11:00–12:30)

Session 16 Urban Design and Urbanism (Online)

Time: 30 September, 11:00 - 12:30
Venue: Online and Place Suite
Session Chair: Vrinda Jariwala (University of Oxford)

ID	Title	Author
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38	Exploring Inclusive Design in the Renovation of Residential Spaces in Shanghai Workers' Villages: Addressing Aging and the Needs of Vulnerable Groups Under Multiple Crises	Li Lyu
49	Does Affordable Housing Exacerbate Urban Sprawl? Evidence From Chinese Cities	Yue Li
62	Rethinking Urban Fragility Analysis: Responding to Fragility Challenges in South Sudanese Cities	Aditya Sarkar, Soraya Goga
89	Parametric Urbanism and AI for Heritage-Centered Resilience: Mitigating Gentrification in Historic City Centers	Alejandra Duarte Montes, Juan Luis De las Rivas Sanz
122	The Construction Wisdom and Inheritance Mechanism of Human Settlements Unit in Tibetan Border Towns in China	Jing Zhang, Yunying Ren, Yuchen Xia

Session 17 Spatial Analysis for Sustainable Cities

Time: 30 September, 11:00 - 12:30
Venue: Lecture Theatre
Session Chair: Nethmi Jayaratne Kariyawasam (University of Oxford)

ID	Title	Author
19	Balancing Compact Urban Form and Ecology: A Spatial Analysis of Sustainability Trade-offs	Tianrui Sun
50	Spatiotemporal Relationship Between Green Product Trade and Air Pollution in China	Zining Wang, Pengyu Zhu
90	A Spatial Division Method for Urban Form Graph Modeling: A Case Study of Nanjing	Zihao Wu, Ziyu Tong
100	Enhancing Urban Energy Resilience to Extreme Heat Events: An Agent-Based Model Simulation Study in Chongqing, China	Yueting Ding, Feng Chen, Zhaohua Wang
111	Proximity vs Presence: Evaluating the 15-Minute City in a Context of Urban Polycrisis	Kofoworola Modupe Osunkoya, Najmeh Mozaffaree Pour, Jenni Partanen
201	A Spatially Explicit Heat-Health Data-Driven Vulnerability Index for Hong Kong: Integrating Mortality Data and Local Context	Maoping WANG

4. Session Agenda (30 Sep 11:00–12:30)

Session 18 Spatial Perception and Urban Experiences

Time: 30 September, 11:00 - 12:30
Venue: Desert Room
Session Chair: Sangwon Chae (University of Oxford)

ID	Title	Author
73	City Image Production Regime Through New Media: An Unsupervised Machine Learning Approach	Jiemei Luo, Peiheng Yu, Ziyu Chen, Tianchen Dai
81	Gendered Differences in Social Networks and Varied Leisure Participation Among Migrants in Urban China	Shan Yu
113	Spatial equity of perceived cultural ecosystem services in urban parks based on social media data: A case study of Turin, Italy	Jingxiong Huang, Anrong Dang
125	Investigating Walking Behaviour and Perceived Walkability of Older Citizens in London	Guanhua Zhao, Mengqiu Cao, Jonas De Vos
149	Thermal-Humidity Dynamics in Tunnel Construction Environments: A Multi-Physics Coupling Analysis for Ventilation and Condensation Control	Xueyan Liu, Zhiwen Luo, Tianyi Zhao
221	Procedural natural scene construction	Chen Zhang, Fu Ren, Renzhong Guo

Session 19 Urban Policy for the Future

Time: 30 September, 11:00 - 12:30
Venue: Atmosphere Room
Session Chair: Qianwen Li (KU Leuvenn)

ID	Title	Author
4	The Impact of Rural Digitalization on Public Service Resilience: A Case Study of the Yangtze River Economic Belt Region	Jiaying Li, Yirui Jiang
5	Green Finance and China's Urban Carbon Unlocking: A Quasi-Nature Experiment Based on Government and Market Moderating Effect	Jingjie Zhou, Xuanyan Chen, Shaozhou Qi
162	Evidence of Public Expenditure Spillovers in Mexico: Measuring the Spatial Interactions Among Municipal Governments	Alejandro Moreno Jimenez
171	Data Usage in Housing Policymaking in Sheffield	Enes Aydin
173	Between Deliberation and Aggregation: Rethinking Decision-Making Sphere of Public Participation in China's Urban Regeneration	Houwei Fu
211	Unravelling the Demand-Side Role in Urban Green Space Equity: A Decade of Policy Suggestions Related to Public Health in China	Puyue Gong, Jinliu Chen, Weipeng Han, Jiming Zhu

4. Session Agenda (30 Sep 13:30–15:00)

Session 20 Applied Urban Data Analytics (Online)

Time: 30 September, 13:30 - 15:00
Venue: Online and Desert Room
Session Chair: Wenlan Zhang (University College London)

ID	Title	Author
29	Pedestrian-Centric Modeling of Air Pollution Exposure in Complex Urban Environments	Feifeng Jiang
36	Detecting Real Events vs Sensor Anomalies in Smart Cities: A Spatio-Temporal Approach During the 2021 Athens Wildfires	Sofia Zafeirelli, Efstratia Chatzi, Dimitris Kavroudakis
60	Mobile Signaling Data Reveals Hidden Healthcare Resources Disparities: Evidence From Shenzhen, China	Xiaohui Ma
154	The Spatial Restructuring Effects of Online Food Delivery on Urban Food Environments: A Case Study of Hangzhou	Li Chen, Haoying Han, Wanglin Yan
183	Spatial Mismatch and Attribution Analysis of Flood Risk and Resilience in Megacities: Insights From a 'Risk-Resilience-Effect' Framework and an Interpretable XGBoost-SHAP Model	Shengwang Bao, Chengzheng Yu, Zhenyang Wan
185	The Equity Impact of Bike-Sharing on Developing X-Minute Cities: A Case Study of 36 Counties and Districts in China	Wenyan Fu, Yongping Zhang

Session 21 Demography and Migration

Time: 30 September, 13:30 - 15:00
Venue: Lecture Theatre
Session Chair: Douglas Leasure (University of Oxford)

ID	Title	Author
47	Reimagining Sustainable Cities: Advancing Migrant Inclusion in Urban Sustainability	Mohammad Anwar Fetrat
168	Spatial Demographics and Cultural Entrepreneurship in Barcelona's Ethnic Enclaves: Data-Driven Analysis of Migration Patterns in the Fondo Neighborhood	Mingqing Yin, Lluís Frago i Clols
180	Urban Nature and the Mental Health of Migrants: The Roles of Sense of Place	Qingyue Xue, Ben Wheeler, Lucy Szaboova, Sarah Bell
209	Understanding Migrant Population's Settlement Intentions in Urban China: The Role of Social Inclusion	Yanru Feng, Peicheng Wang, Jiming Zhu, Chenggang Zhang
210	Natural Disasters and Migrant Population's Settlement Intentions: The Moderating Role of Social Inclusion	Peicheng Wang, Yanru Feng, Puyue Gong, Jiming Zhu
212	The EU Rural Development Policy and Integration of Migrants	Gönül Oguz

4. Session Agenda (30 Sep 13:30–15:00)

Session 22 Urban Fragility and Resilience

Time: 30 September, 13:30 - 15:00
Venue: Atmosphere Room
Session Chair: Pan Ei Ei Phyoe (University of Oxford)

ID	Title	Author
8	Resilience Governance in Old and Dilapidated Communities From the Perspective of Risk Inequality: Obstacles, Approaches and Strategies	Jian Song, Yuefang Rong, Haoxi Lin, Mengyuan Jia
72	Quantifying Flood Resilience in England: The Challenge of Data Availability and Scale	Anna Goodden, Francesca Vantaggiato, James Porter
138	Testing the Effect of Agricultural Subsidy Policy in the Context of Food Security: Taking the Reform of the Corn Purchase and Storage System as an Example	Ziduan Zheng
145	Introducing Dynamic Temporal Factors Into the Life Cycle Assessment of Community Energy Systems: A Case Study of a Campus in Cold Regions of China	Yiting Wang, Yacine Rezgui, Tianyi Zhao
191	Insights on Local Officials and Public Participation in Urban Planning: Evidence from Chinese Cities	Xu Haiyun, Meng, Miao, Zhu, Fangyu, Ding, Qi
207	Navigating Complexity: Building Urban Resilience Through Systems Thinking in the Age of Compounding Risks	Leila Irajifar

Session 23 Urban Green Space

Time: 30 September, 13:30 - 15:00
Venue: Place Suite
Session Chair: Yongping Zhang (Zhejiang University)

ID	Title	Author
12	How Visual Green Exposure Promotes Urban Park Engagement: A Causal Analysis Using Mobility Data and Park Panoramas	Yichun Zhou
27	Optimization of Urban Greenspace Using AI for SUHI Mitigation: Prospects of Dhaka City, Bangladesh	Musarrat Zaman, Yuan Shi
42	How Grey-Green Spatial Morphology of Neighborhood Block Shapes Urban Heat and Air Pollution Islands	Keyu Luo, Weifeng Li
84	Impacts of Land Surface Temperature and Ambient Factors on Near-Surface Air Temperature Estimation: A Multisource and Multiscale Evaluation	Songyang Li, Man Sing Wong, Rui Zhu, Guoqiang Shi
96	Spatiotemporal Shifts of Plant Phenology and Their Climatic Drivers in Subtropical Urban Areas: A Case Study of Hong Kong	Run Li
190	Possibilities of Greener Cities: Advancing a 3D Approach	Shoubang Huang, Kai Zhou, Shiyang Zhang, Xiangrong Wang

Session 1 AI and Extreme Weather Events

28. GeoAI Empowers Resilient City Construction: An Intelligent Urban Flood Modeling Framework Considering Composite Geographic Features

Authors: Hengxu Jin, Shuliang Zhang, Reinhard Hinkelmann

Abstract: In current research on urban living environments, there are persistent challenges such as insufficient consideration of multi-dimensional factors and difficulties in comprehensive evaluation. This study conceptualizes the city as a diversified structure of "human–space–ecology" and applies geospatial artificial intelligence (GeoAI) methods to identify the composite geographical features of different urban districts, uncovering their potential links with the spatial heterogeneity of living environments. First, a deep learning model is employed to extract human visual perceptual emotions. Then, leveraging the cross-lingual representation capability of Multilingual BERT, the semantic associations between geospatial data and the social-functional categories of urban spaces are modeled. Next, natural background features reflected by land-use data are integrated to generate multi-dimensional feature-fusion layers, enabling the intelligent identification of composite geographical features. Subsequently, five core indicators—air pollution, heat effects, among others—are incorporated to explore the inequitable spatial distribution of living environments. Finally, the correlations between composite geographical feature values and multiple burden values of the living environment are analyzed to assess the potential of GeoAI in empowering urban sustainability. Experimental results indicate a strong negative correlation between composite geographical feature values and living environment burden values in the study area. Our work not only validates the scientific soundness of the "human–space–ecology" intelligent framework in identifying urban composite geographical features, but also reaffirms the critical role of GeoAI in advancing sustainable urban development.

Keywords: Urban resilience; GeoAI; Urban flooding disaster; Spatiotemporal big data; Machine learning

80. Deep Learning for Decoding Compound Risks: Climate-Urbanization Synergies in Flood Susceptibility Forecasting Under SSP-RCP Scenarios in Beijing, China

Authors: Tianlian Wang, Zhe Li

Abstract: Climate change and urbanization amplify urban flooding risks, threatening sustainable development. Traditional methods for assessing flood susceptibility, such as numerical simulations and single machine learning models, exhibit limitations when confronted with spatial heterogeneity, dynamic environmental factors, and high-dimensional data. These constraints hinder the advancement of flood prediction accuracy. We propose an interpretable hybrid deep learning framework to predict urban flood susceptibility under climate-urbanization synergies, using megacity Beijing as a testbed. Spatial heterogeneity is addressed through Optimal Parameter Geodetector and Boruta algorithms to identify key drivers. Our Hybrid SNN-KAN-Attention model integrates: 1) Spiking Neural Networks (SNN) for temporal rainfall feature extraction, 2) Knowledge Adaptive Networks (KAN) to decode nonlinear driver relationships, and 3) Attention mechanisms capturing spatial heterogeneity. The SHAP interpretation model, alongside Partial Dependence Plots (PDP), is integrated to examine the nonlinear driving mechanisms of the key factors and simulate the spatial and temporal evolution of flood susceptibility risk for the period 2020-2100 based on the coupled SSP-RCP scenarios. Results demonstrate the hybrid model's superiority over traditional methods, achieving 0.88 accuracy (10%-20% improvement), 0.93 AUC, with ablation studies confirming the criticality of attention and KAN modules. The primary drivers of flood susceptibility identified include distance to roads, soil type, and road network density. Projections reveal Beijing's flood risk will intensify with climate-urbanization synergies, exhibiting 23%-41% high-risk area expansion by 2100, particularly under SSP5-8.5. Risk gravity shifts toward expanding urban peripheries. This framework advances climate-adaptive urban planning through improved prediction accuracy and mechanistic interpretability, offering actionable insights for flood risk management.

Keywords: Flood risk; Hybrid deep learning model; Climate change; Risk assessment; Explainable artificial intelligence

Session 1 AI and Extreme Weather Events

116. Spatiotemporal Modelling of Flood Risk Using Building-Level Data: The Case of North Jakarta

Authors: Zahratu Shabrina, Jin Rui, Emma Colven

Abstract: The phenomenon of data silos hinders synergistic decision-making for energy efficiency optimization and environmental safety in urban crisis management. This study presents two Artificial Intelligence (AI) frameworks to mitigate these barriers. First, a multi-source domain generalization model with an encoder-decoder architecture is developed to predict building energy consumption across heterogeneous datasets without requiring localized retraining. By refining the shared patterns from different building energy datasets, the model achieves an accurate cross-building hourly prediction task and has some prediction capability for some buildings of the same type without training data. Second, a multi-task learning architecture enhanced by Customized Gate Control is proposed to concurrently forecast temperature/humidity shifts at multiple indoor monitoring points within the same building. Even if only a portion of the training data is available at a given point in time, the framework utilizes correlation between tasks to ensure accuracy in predicting tasks up to 24 hours in advance, enabling resource-efficient data sharing among HVAC design, operations, and emergency response teams. Both architectures have been validated on real office building datasets. The possibility of efficiently training predictive models for different tasks by machine learning based on the integration of isolated data streams is demonstrated. In the face of data silos, the proposed modeling architecture establishes a foundation for collaborative decision-making in urban crisis management. The multi-source domain generalization model supports grid demand-side regulation through generic cross-building energy consumption prediction, while the multi-tasking framework assists in the design and operation of HVAC systems by exploiting spatial correlations in environmental data. This approach addresses the challenge of interoperability of critical information without enforcing a high degree of data sharing, thus providing a technically verifiable pathway to a sustainable system of collaborative urban governance.

Keywords: Flood risk; Gtwr; Machine learning; Deep learning; Vision language model; Building-level data

141. Two Data-Driven Intelligent Frameworks for Building Energy Consumption and Indoor Environment Prediction Tasks in Urban Crisis Management

Authors: Ben Jiang, Tianyi Zhao

Abstract: The phenomenon of data silos hinders synergistic decision-making for energy efficiency optimization and environmental safety in urban crisis management. This study presents two Artificial Intelligence (AI) frameworks to mitigate these barriers. First, a multi-source domain generalization model with an encoder-decoder architecture is developed to predict building energy consumption across heterogeneous datasets without requiring localized retraining. By refining the shared patterns from different building energy datasets, the model achieves an accurate cross-building hourly prediction task and has some prediction capability for some buildings of the same type without training data. Second, a multi-task learning architecture enhanced by Customized Gate Control is proposed to concurrently forecast temperature/humidity shifts at multiple indoor monitoring points within the same building. Even if only a portion of the training data is available at a given point in time, the framework utilizes correlation between tasks to ensure accuracy in predicting tasks up to 24 hours in advance, enabling resource-efficient data sharing among HVAC design, operations, and emergency response teams. Both architectures have been validated on real office building datasets. The possibility of efficiently training predictive models for different tasks by machine learning based on the integration of isolated data streams is demonstrated. In the face of data silos, the proposed modeling architecture establishes a foundation for collaborative decision-making in urban crisis management. The multi-source domain generalization model supports grid demand-side regulation through generic cross-building energy consumption prediction, while the multi-tasking framework assists in the design and operation of HVAC systems by exploiting spatial correlations in environmental data. This approach addresses the challenge of interoperability of critical information without enforcing a high degree of data sharing, thus providing a technically verifiable pathway to a sustainable system of collaborative urban governance.

Keywords: Multi-source domain generalization; Multi-task learning; Building energy consumption forecast; Indoor environmental variable prediction; Data silos

Session 1 AI and Extreme Weather Events

144. Urban Planning Priorities Analysis Based on Urban Heat Risk Supply-Demand Mismatch: A Case Study of Hangzhou, China

Authors: Congyue Zhou, Huan Chen

Abstract: Urban heat risk (UHR) increasingly threatens public health and sustainable development in rapidly urbanizing regions. However, existing studies often overlook the spatial mismatch between ecological supply and thermal demand, and lack effective tools for evaluating intervention priorities under nonlinear and spatially heterogeneous conditions. To address this gap, this study integrates multi-source data to quantify the supply–demand dynamics of urban thermal regulation services. Meanwhile, this study employs a hybrid RF-GWR model that integrates Random Forest with Geographically Weighted Regression, and introduces a Prioritization Index (PRI) to identify high-priority intervention zones in Hangzhou and support refined UHR management. Results show that 81% of the study area experiences varying degrees of mismatch, with 35 streets—mainly located in Gongshu, Shangcheng, and Linping districts—identified as high-priority zones. Nonlinear threshold analysis reveals that Ah Ratio > 0.32 significantly increases heat risk, whereas Ag Ratio > 0.1 and Ab Ratio > 0.035 contribute to its mitigation. Interaction analysis further shows that the combined influence of paired factors exceeds that of individual variables, with the interaction between Ab Ratio and Ah Ratio exhibiting the strongest joint effect ($q = 0.65$). The RF-GWR model demonstrates high predictive accuracy ($R^2 = 0.87$) and effectively captures localized spatial patterns. The proposed framework provides a practical and transferable approach for data-driven urban thermal planning, with important implications for targeted ecological interventions in climate-sensitive cities.

Keywords: Urban heat risk; Supply-demand matching; Planning interventions; Machine learning; Geographically weighted regression

177. Nonlinear Modeling and Long-Term Flood Risk Prediction in Jakarta Based on XGBoost and SHAP: A Multi-Source Data-Driven Study of Hazard Mechanisms and Trend Evolution

Authors: Jin Rui, Zahratu Shabrina, Emma Colven

Abstract: Driven by intensifying land subsidence, increased surface imperviousness, and inadequate drainage capacity, Jakarta has experienced a rising frequency, severity, and spatial extent of urban flooding in recent years. Especially under the combined effects of tidal surges and heavy rainfall, the interplay between seawater backflow, river overflow, and drainage system failure has increased the complexity of flood forecasting.

This study develops a nonlinear regression framework based on XGBoost, utilizing multi-source, high spatiotemporal resolution data from 2017 to 2024 to identify the nonlinear mechanisms of compound flood-driving factors and dynamically predict future flood risks. Key variables include land subsidence, rainfall, tidal levels, river water levels, drainage system indicators, land cover, building density, population density, impervious surface ratio, and land surface temperature. Supplementary data are derived from remote sensing-based vegetation and blue-green infrastructure distribution, historical flood records, and spatial information on rivers and water pumps. Flood intensity is measured through a composite index incorporating inundation depth, extent, and frequency.

The modeling process accounts for multicollinearity and spatiotemporal lag effects, while SHAP (SHapley Additive exPlanations) analysis is employed to rank variable importance and interpret local sensitivities. Preliminary findings suggest that land subsidence rate, frequency of extreme tidal events, and drainage capacity per unit area are the three most critical factors, exhibiting strong nonlinear interaction effects in high-value ranges. Built-up density and green space ratio also play regionally heterogeneous moderating roles. Model simulations indicate that, without effective intervention, flood intensity in several core areas of Jakarta may grow exponentially after 2040.

This study breaks through traditional linear analysis by integrating ensemble learning and multi-source data, revealing the nonlinear and interactive characteristics of compound flood mechanisms. It provides a data-driven foundation for identifying high-risk zones, prioritizing adaptive infrastructure planning, and offering methodological references for disaster resilience in other coastal cities facing land subsidence risks.

Keywords: Land subsidence; Compound hazard factors; Nonlinear regression; Xgboost; Flood prediction; Urban resilience

Session 2 Critical Examination and Application of Smart Cities

77. Mapping Data Sources and Types for the SCORELINE Method in Urban Open Space Quality Assessment

Authors: Milena Vukmirovic, Miroslava Raspopovic, Jovana Jovic

Abstract: Urban areas worldwide are dynamic and continuously evolving, creating diverse conditions for public life. As these spatial settings shift, a key question emerges: How can we systematically assess their impact on urban quality of life? This study addresses this question by applying the SCORELINE method, an analytical framework for evaluating the quality of open public spaces across six interrelated criteria: (i) safety and security, (ii) convenience and accessibility, (iii) legibility, (iv) comfort, (v) inspiration, and (vi) liveability. Each criterion was further structured using defined subcategories and indicators that guided the evaluation process.

The Urban500 project served as a testbed for the implementation and expansion of this method. Focusing on pedestrian environments within 500 steps from local elementary schools—areas which often define residents' daily urban experiences — the project analyses open spaces in dense urban cores, where car dominance increasingly threatens spatial quality and human-scale design.

Traditionally, data for this type of assessment has been collected through field surveys and observational methods. Although these approaches offer valuable insights, they are time- and resource-intensive. This study proposes an extended methodological approach that maps and integrates various complementary data sources, including geo-referenced social media content, environmental and mobility sensor data, public APIs, and open data portals across transportation, health, and recreation sectors.

The proposed approach enhanced the responsiveness and spatial sensitivity of public space assessments by aligning these heterogeneous data sources with the SCORELINE framework. Ultimately, this contributes to more grounded insights into how pedestrian-scale environments support urban mobility systems and spatial equity, offering a practical tool for decision-making in transport planning and the spatial economy.

Keywords: Public space quality; Scoreline method; Urban mobility; Data integration; Spatial analysis

97. Leveraging LLMs in Analysis of Public Feedback on Smart City Infrastructure: A Case Study of Shanghai

Authors: Zhaowen Deng, Lili Lin

Abstract: The construction of smart cities in China has rapidly accelerated, with significant advancements in the intelligent upgrading of urban infrastructure. As central actors in smart city development, public concerns and the government's responsiveness are critical to project success. However, existing research has primarily focused on participation modes and platforms, with limited attention to public concerns during the implementation phase. Moreover, studies exploring the relationship between government responses and public satisfaction often rely on case study methods, lacking systematic analysis supported by natural language processing (NLP).

In response to these identified gaps, we examine digital public participation in Shanghai's smart city development. We use data from "Message Board for Leaders" since 2019, proposes a three-step analysis framework that leverages the semantic understanding and generative capacities of large language models (LLMs) under zero-shot and few-shot settings. First, LLMs are trained to understand scenario classifications (Economics, Living, Governance) and validated with results from Latent Dirichlet Allocation (LDA) topic modelling. Second, public messages associated with extreme satisfaction levels are analysed to extract key public concerns and government response characteristics. Third, LLMs are utilized as AI agents to generate simulated responses, which are compared with actual government replies in terms of content and linguistic style, systematically evaluating the potential and limitations of LLMs in smart city governance contexts.

We anticipate that LLMs can enhance the classification of public messages and interpretation of unstructured content, helping to identify gaps in government responses. Simulated replies may offer improved clarity and communication efficiency, though challenges remain in policy referencing and factual accuracy. This study aims to advance understanding of public-government interactions and explore the potential of AI-assisted participation mechanisms in smart city governance.

Keywords: Smart city infrastructure; Public participation; Large language models; Government responsiveness; Public satisfaction

Session 2 Critical Examination and Application of Smart Cities

107. The Transition of Automated Mobilities in New Zealand

Authors: Moayad Shammut, Muhammad Imran

Abstract: The rapid advancement in artificially intelligent (AI) technologies and driving automation as well as connective technologies, could potentially transform urban transportation systems. Automated vehicles (AVs) may have economic, social and environmental implications for future cities. However, the complexity of transitioning towards safer AVs is fundamental to exploiting any benefit from AVs. This paper discusses a framework of AVs transition in New Zealand (NZ) through three 'mobilities' dimensions.

First, the social dimension explored how social meanings influence AVs transition. This research found that developing societal trust in AVs is influenced by the reputation and achievements of regulators and technology developers. Second, the governance dimension explored how political-institutional factors influence AVs transition. The research found that strong political leadership coupled with investments in AVs could catalyse a smooth AVs transition. Third, the smart dimension covers how technology risk and readiness influence AVs transition. The research found that the NZ roading network requires considerable adjustments to existing (physical and digital) infrastructure before a smooth AVs transition.

Overall, this research challenges the traditional technical rhetoric that assumes AVs can be deployed 'everywhere' and 'under all conditions' and argues for a greater understanding of the complexity of real-life regulatory and urban environments. This research suggests that political leadership should evolve in such a way that it can respond to the growing AI and AVs market, where business models develop primarily based on the creative destruction of existing transport practices.

Keywords: Transitions; Automated mobilities; Governance; AI; Cities

139. Research on Smart City Governance Mechanism Under the Threshold of Digital Twin Driving: Practical Exploration Based on Data Integration and Institutional Synergy in Zhengzhou City

Authors: Xiangyu He

Abstract: Digital twin technology, as the core support means for smart city construction, provides a new paradigm for urban governance through the dynamic mapping of physical entities and virtual space. Based on the theoretical framework of digital twin, this paper systematically explores the path of smart city construction in Zhengzhou City, Henan Province, China, by combining the practical cases of digital twin. The study finds that Zhengzhou City, with the goal of 'whole-area sensing, data fusion, intelligent decision-making, and dynamic optimisation', relies on digital twin technology to build a city information model (CIM), integrates multi-intelligence dynamic simulation algorithms, and realises multi-dimensional applications in the fields of urban planning, traffic optimisation, environmental monitoring, and emergency management. However, in practice, it still faces challenges such as data silos, privacy leakage risks, and lack of technical standards. In response, Zhengzhou City has strengthened top-level design, formulated unified data sharing protocols and security norms, and promoted cross-departmental collaboration; meanwhile, it has introduced a market-based mechanism to attract technology enterprises and capital to participate in infrastructure construction, and set up a talent cultivation system to enhance technological autonomy. The study shows that the practical application of digital twin technology significantly improves the refinement level of Zhengzhou smart city construction, but its sustainable development needs to further strengthen the institutional safeguards and ethical constraints, and balance technological innovation and social acceptance. This study provides theoretical references and practical insights for digital twin-driven new smart city construction.

Keywords: Digital twins; Smart cities; Urban governance

Session 2 Critical Examination and Application of Smart Cities

158. Smart and Healthy Lighting for Urban Children: Data-Driven Strategies for Resilient Home Learning Spaces

Authors: Quanlong Liu, Mengqiu Cao, Yuhong Wang

Abstract: Urban children are increasingly exposed to compounded risks posed by interlinked crises—such as pandemics, energy instability, and educational inequality—that exacerbate poor lighting conditions in home learning environments. This paper investigates how smart lighting systems, underpinned by data analysis and clean energy integration, can enhance children's visual health, learning performance, and household resilience in densely populated cities. Drawing on a mixed-methods master's study and an ongoing PhD research proposal, this work examines the lighting conditions in home-based study spaces for school-age children (6–14 years) in Beijing. Data were collected through structured surveys, in-depth interviews, and on-site illuminance measurements. The study reveals significant deficits in daylight access, circadian-effective lighting, and visual comfort—particularly among households with limited spatial and financial resources. The paper proposes a data-driven framework for adaptive, child-centric lighting design that leverages IoT-enabled monitoring, AI-based prediction, and real-time energy optimisation. By positioning lighting poverty as a hidden but critical urban inequality, the research contributes to broader conversations around urban resilience, equitable resource allocation, and sustainable development. This work aligns with the City+2025 theme by demonstrating how urban data analysis can guide targeted lighting interventions, promote health resilience, and inform public policy in the face of polycrisis challenges affecting vulnerable populations.

Keywords: Smart lighting; Urban children health; Resilience lighting; Poverty; Data-driven urban policy

186. Paradigm Shift in Resilient Governance for Smart City Development: An Integrated Synergy-Resilience Framework

Authors: Ben Hao

Abstract: Against the dual pressures of accelerating climate change and deepening digitalisation, conventional smart-city governance confronts two systemic challenges: technological rigidity and institutional lag. Grounded in Complex Adaptive Systems (CAS) theory and an institutional-resilience perspective, this paper proposes a Dynamic Synergistic Resilience Governance (DSRG) framework to bridge the disjunction between technological empowerment and institutional adaptation. DSRG comprises three interlocking dimensions—nested resilience levels, adaptive feedback loops, and multidimensional synergistic networks—operationalised as (i) a nested resilience system spanning physical infrastructure, digital institutions, and social capital; (ii) an adaptive sensing–decision-making–execution loop underpinned by digital-twin and AI-driven large-scale models; and (iii) a four-actor synergistic network linking government, market, society, and technology platforms. Comparative case studies of Hangzhou and Singapore reveal that rapid technology iteration compresses the institutional adaptation window, while greater social participation enhances risk-response efficiency. To illuminate the co-evolutionary pathway of technological empowerment and institutional innovation, the study introduces three actionable mechanisms—Resilience Legislation Pilot Zones, a Digital-Artificial Dual-Circuit System, and Resilience Integration Nodes. Together, these mechanisms chart a synergistic evolution path that both advances resilience-governance theory and offers practical guidance for policymakers seeking to reconcile technological dynamism with institutional robustness in the smart-city era.

Keywords: Smart city; Resilience governance; Institutional adaptation

Session 3 Resilience and Extreme Events in Mobility Systems

7. All Roads Lead to Rome: The Role of Road Networks in the Economic Resilience of Cities

Authors: Yujing Yang, Nicholas Horsewood

Abstract: This research integrates geospatial analysis and economic modelling to explore how spatial structures shape economic resilience and how markets overcome geographical constraints in China. While existing research on urban resilience often focuses on localized factors, we emphasize the role of inter-city connectivity and spatial cooperation in mitigating economic downturns.

We employ GIS-based network analysis, machine learning clustering, and spatial econometrics to analyse how transport infrastructure influences economic performance and regional inequality. We construct a spatial and social-economic interaction framework to assess the impact of market accessibility on post-pandemic recovery. Our findings show that transport connectivity play an important role in shaping economic resilience, particularly by enhancing access to major urban centres and promoting inter-regional collaboration. Furthermore, disparities in infrastructure accessibility exacerbate spatial inequalities, underscoring the need for targeted investments to support vulnerable regions.

Keywords: Network analysis; Market accessibility; Economic resilience; K-means cluster; Spatial econometrics

30. Extreme Weather Events and Traffic Disruptions: A Modelling Framework for Resilience Policy Design With a Case Study

Authors: Pietro Mariano, Francesco Guglielmi, Pierluigi Coppola

Abstract: Intensifying climate change is increasing frequency and severity of extreme weather events, such as floods, heatwaves, and storms, threatening transport networks functioning. Mitigation and preparedness measures are, therefore, essential for reducing hazard severity while improving system performance, reliability, and robustness.

This study focuses on the resilience of urban networks to extreme flood events and present a methodological approach to assess the impacts on urban transport using traffic simulation, and to design resilience policies to mitigate risks and maintain operational continuity during climate crises. Two vulnerability indicators are defined: the unmet travel demand (reflecting the distribution in accessibility loss) and the increase in vehicle-hours (quantifying the delays in the network due to network capacity reduction and congestion).

The case study considered is the city of Milan that, like many European cities, was developed around rivers and canals, drained to accommodate urban expansion. Today, they resurface during intense rainfall, causing street-level flooding and mobility disruptions. Notably, in the past decade, two rivers flowing through Milan (i.e. Seveso and Lambro rivers) overflowed approximately a dozen times, with half of these events resulting in severe traffic paralysis and economic damage.

Findings allow to estimate the consequences of flooding on urban mobility and provide a framework for prioritizing infrastructure upgrades, emergency response plans, and adaptive policies. In so doing, the work contributes to urban resilience planning practice by integrating flood risk dynamics with transportation network performance, ensuring equitable mobility access.

Keywords: Transport networks; Flooding risk; Simulation models; Mitigation measures; Preparedness

Session 3 Resilience and Extreme Events in Mobility Systems

70. Unravelling Economic-Spatial Interaction in Urban Agglomerations: A Network Analysis of the Yangtze River Delta

Authors: Bohao Su

Abstract: With growing global economic instability, evolving patterns of industrial collaboration, and the increasing role of urban agglomerations as regional economic cores, understanding inter-city economic linkages—particularly those shaped by geographical proximity—has become ever more important. In this context, this study examines the interplay between spatial connectivity and manufacturing dependency networks within the Yangtze River Delta urban agglomeration from 2012 to 2023, using a network science approach. Temporal analysis reveals a steady divergence between spatial and economic networks, indicating that manufacturing dependencies are becoming increasingly decoupled from geographical proximity. This structural shift underscores the emergence of multi-centered, resilient urban systems less vulnerable to localized disruptions. Moreover, external shocks such as the COVID-19 pandemic appear to have accelerated this decoupling trend, reinforcing the urgency of rethinking urban connectivity beyond purely spatial frameworks. The findings highlight the value of incorporating data-driven network insights into urban policy—both to strengthen regional supply chain resilience and to better understand the complex, multi-layered interactions shaping contemporary urban systems.

Keywords: Urban agglomerations; Network comparison; Supply-chain dependency networks; Yangtze river delta

95. Transport Infrastructure and Economic Resilience in Jakarta, Indonesia: The Cobb–Douglas Production Function Analysis Amid Polycrisis

Authors: Hansha Devi Kistamah

Abstract: Jakarta, Indonesia's capital, faces severe urban challenges—congestion, flooding, and pollution, making it a key example of polycrisis driven by environmental, infrastructural, and socio-economic pressure. This paper examined the role of transport infrastructure in sustaining Jakarta's economic output during such complex disruptions. By applying a modified Cobb–Douglas production function, this study quantifies the contributions of transport efficiency to regional economic resilience.

This study adopts an extended Cobb–Douglas production function following methods used in studies to analyse Jakarta's quarterly Gross Regional Domestic Product, incorporating transport efficiency and polycrisis impacts. The model employs total infrastructure asset, labour force, transport efficiency indicators (such as BRT/MRT ridership, congestion index), and a dummy variable capturing polycrisis events (eg. COVID-19 pandemic or floods). Data from 2013 to 2023 are sourced from BPS Jakarta, the Jakarta Transport Agency, BNPB, BMKG, Bank Indonesia, World Bank, and ADB. All variables are converted into quarterly series and analysed in a log-linearised production function to estimate the relationship between economic output and the selected factors.

Transport investment is expected to boost Jakarta's output, while polycrisis events reduce it. Improved transport efficiency may offset crisis impacts, supporting resilient infrastructure policies. This study advances Southeast Asian urban research by linking transport efficiency and polycrisis impacts, offering policy insights for climate-resilient mobility aligned with SDGs 9, 11, and 13.

Keywords: Transport infrastructure; Economic resilience; Polycrisis

Session 3 Resilience and Extreme Events in Mobility Systems

181. Urban Mobility Management in Response to Disasters: A Social Cybernetics Perspective

Authors: Jian Li

Abstract: Social cybernetics is a discipline that applies cybernetics to study social systems. Cybernetics emphasizes the information feedback mechanism and adaptive ability of the system, so that the system can remain stable and adaptable when facing external changes and internal disturbances. The increasingly improved data environment provides a solid foundation for the application of social cybernetics in disaster management. Inspired by the ideas of social cybernetics, this study proposes a decision support system for cities to cope with disasters. The system regards disasters as natural experiments, which can capture the macro-feature monitoring and micro-behavior analysis of human mobility during disasters, and realize the macro-micro nested analysis of certain scenarios. The study takes the COVID-19 pandemic as an example to verify the feasibility of the decision support system. In response to the needs of epidemic prevention and control decision-making, big data can be used to actively identify the signs of changes in the characteristics of personnel mobility, and then a small sample survey can be designed to analyze the travel behavior of people in specific travel scenarios, and the traffic model can be updated simultaneously to analyze the evolution of the situation, providing a reference for decision-making. In addition, the implementation effect of policies can be judged through information feedback means such as online public opinion, thus forming a feedback loop for policy analysis.

Keywords: Social cybernetics; Urban mobility management; Disaster; Big data; Macro-micro nested analysis

196. Impact of Climate-Induced Disturbances on the Resilience of Urban Road Transport Systems

Authors: Mohammad Sharif, Dirk Wittowsky

Abstract: The long-term reliability and functionality of transportation systems are increasingly threatened by the impacts of climate change and the growing frequency of extreme weather events. In urban settings, road networks are critical components that facilitate the mobility of people and goods and support overall city functionality. However, climate-induced events such as heatwaves, meteorological droughts, and heavy precipitation have escalated in frequency and intensity, imposing significant disruptions on urban traffic systems. To ensure sustainable urban mobility, it is essential to assess and enhance the resilience of these systems.

This study evaluates the performance and resilience of urban road networks under extreme weather conditions, using the city of Duisburg, Germany, as a case study. Duisburg, home to Europe's largest inland waterway port, plays a strategic role in trimodal transport -road, rail, and water- making it a critical hub for freight and private transport. By applying dynamic traffic modeling, the study simulates the impact of moderate and extreme scenarios of heavy rainfall, heatwaves, and low water levels on both private and freight transportation modes. Key performance indicators such as traffic demand, traffic flow, and travel time are analyzed to quantify system resilience.

The results identify spatial and temporal variations in network performance, highlighting the most vulnerable and critical segments within the city's road infrastructure. These insights provide a foundation for targeted policy interventions and infrastructure investments aimed at strengthening climate resilience. Ultimately, this research support urban planners and policymakers in building adaptive, robust, and sustainable transport systems capable of withstanding future climate uncertainties.

Keywords: Climate change; Transport network; Resilience; Urban mobility

Session 4 Data-driven Methods for Urban Issues (Online)

55. Mapping Knowledge: Fuzzy Cognitive Maps as Participatory Urban Data in Nagaland, India

Authors: Thejangunuo Keretsu, Arvind Lakshmisha, Harini Nagendra

Abstract: As urbanization accelerates across India, cities are expanding into culturally complex ,ecologically sensitive, and institutionally plural landscapes. Urbanisation in the northeastern state of Nagaland presents a compelling case of governance at the intersection of traditional institutions, rich ecosystems, and urban transformation. It is characterised by both development opportunities and governance dilemmas, intensified by fragmented data systems that often overlook the lived knowledge of local institutions and indigenous actors.

This research explores the use of Fuzzy Cognitive Mapping (FCM) as a participatory data-generative tool to document, analyse and simulate multi-stakeholder perceptions of urban expansion. Engaging a cross-section of actors—local government agencies, women's organisations, students and youth associations—the study reveals how human-environment tensions, such as the trade-off between economic gains from stone quarrying and long-term ecological harm, shaping local perceptions of risk and opportunity. Thus, demonstrating how systems-thinking practices are embedded at grassroots, where the state's decentralised governance framework (Urban/Village Development Boards), help integrate community-driven systems in managing ecological risks.

Using FCM, the study formalises qualitative insights into structured models to offer alternative urban data embedded in participatory approaches, capturing the governance polyphony of Nagaland's urban development. The resulting model shows how urbanisation interacts with ecological systems (forests and water) not merely through infrastructure or market dynamics, but via shifts in authority, voice and cultural values. We also highlight how community-led conservation and ecotourism mediate the polycrisis by providing adaptive, place-based knowledge.

We argue for a reconceptualisation of urban data to include participatory, relational and contextual insights generated from experiential knowledge of communities navigating change. FCM, as a low-tech, high-context methodology, bridges formal urban planning and informal governance structures to build inclusive urban data, serving as a tool for adaptive governance, policymaking, and local empowerment in sustainable urban transitions in the age of Anthropocene.

Keywords: Participatory urban data; Fcm; Ecological risks; Urban transformation; Conservation

56. Urban Planning for Social Resilience: The Role of Urban Structure in Mitigating Social Conflict Amid Food Price Volatility in Sub-Saharan Africa

Authors: Anbang Xie

Abstract: Food price volatility has been identified as a significant driving factor of social unrest, particularly in sub-Saharan Africa. While existing studies often attribute social unrest to macro-level structural factors like political exclusion and national economic inequality, this approach may overlook the immediate, localized dynamics of social conflicts including violent protests and riots. In conflict resolution research and computational social science, these events are frequently characterized as "atomic events"—spontaneous and short-lived—suggesting that high-level structural explanations may not fully capture their causality. Given that social unrest predominantly occurs in urban areas, it is imperative to consider urban-specific factors. This study investigates how urban structure—specifically, compactness and polycentricity—moderates the impact of food price shocks on social unrest. Utilizing data from the Armed Conflict Location & Event Data Project (ACLED) and the Social Conflict Analysis Database (SCAD), we constructed two event datasets that distinguish between events occurring in urban centers, suburban areas, and rural regions. Building upon the social conflict dataset we developed, we conducted further analysis. We find that significant fluctuations in food prices correlate with increased intensity of social unrest in urban areas. However, cities characterized by lower compactness and higher degrees of polycentricity exhibit a mitigated response to such shocks. These results suggest that urban planning strategies promoting decentralized and less densely concentrated urban forms may enhance social resilience to food-related economic shocks.

Keywords: Food security; Social resilience; City structure; Compactness; Polycentricity

Session 4 Data-driven Methods for Urban Issues (Online)

58. What Is the Interplay Between Artificial Intelligence (AI) and Low-Carbon City (LCC) Development?

Authors: Xingchen Lai, Yuxin Zhang, Hiroatsu Fukuda

Abstract: Since China's implementation of the "Dual Carbon" policy (carbon peaking and carbon neutrality), developing Low-Carbon Cities (LCC) has become integral to national strategy. Artificial Intelligence (AI), as a transformative technology, demonstrates significant potential in driving innovation, reducing energy consumption, and accelerating decarbonization. Utilizing panel data from 30 Chinese provinces (2013–2023), this study constructs evaluation frameworks for LCC and AI development, analyzes regional disparities, and investigates their interdependencies. Key findings reveal:(1) Spatial heterogeneity in LCC and AI development, with levels declining gradiently from eastern coastal to central/western inland regions. Eastern provinces, bolstered by stronger economies and technological infrastructure, lead in adopting advanced technologies, upgrading industries, and fostering green economies, achieving notable low-carbon progress. Conversely, central and western regions lag due to economic constraints and limited access to technological resources, resulting in uneven LCC and AI advancement.(2) AI positively drives LCC development, with a 1% increase in AI capacity correlating to a 0.496% rise in LCC performance. This underscores AI's critical role in optimizing energy systems, enhancing efficiency, and enabling smart urban management. To address regional imbalances, targeted policy interventions are imperative: prioritizing funding and technology transfer to underdeveloped regions, coupled with investments in AI talent cultivation, could bridge developmental gaps and foster LCC-AI synergies.In conclusion, AI serves as a catalyst for China's low-carbon transition. Sustained technological innovation and policy support are expected to amplify LCC achievements, positioning China as a key contributor to global carbon neutrality. These insights offer actionable strategies not only for China but also for nations seeking climate-resilient, sustainable urbanization. By addressing regional disparities and leveraging AI's transformative potential, policymakers can advance equitable low-carbon development while fulfilling global climate commitments.

Keywords: Low-carbon city (lCC); Artificial intelligence (AI); China; Evaluation system

108. Understanding Fear of Crime in Macau: A Two-Study Approach on Vulnerability, Past Victimization, and Neighborhood Disorder

Authors: Liangliang Rong, Pengjie Ju, Kehui Wu, Lixia Peng

Abstract: This study investigates the determinants of fear of crime among residents in Macau—an Asian city uniquely shaped by legalized gambling, high tourist density, and complex cultural dynamics. To comprehensively examine how individual characteristics, victimization experience, and neighborhood conditions influence fear of crime, a two-study mixed-methods design is employed. Study 1 utilizes large-scale secondary data from the Macau Social Survey to assess general patterns and test the applicability of Western models in the local context, while Study 2 refines the conceptualization of fear through multidimensional measurements.

Quantitative analyses are conducted using SPSS 26.0/27.0 and AMOS 24.0, including descriptive statistics, Pearson correlation analysis, t-tests, and multivariable linear regressions. Descriptive statistics outline the demographic profile and fear levels among residents, while correlation analysis identifies initial associations between variables. Independent sample t-tests explore group differences based on gender, marital status, victimization history, and permanent residential status. Regression models sequentially test the effects of (1) vulnerability characteristics (e.g., age, gender, language proficiency, residency status), (2) past victimization experience, and (3) neighborhood disorder (including physical, social, and gambling-related indicators). R-squared statistics assess improvements in model explanatory power.

By integrating large-scale empirical testing with robust statistical modeling, this research contributes to theory refinement and policy insight, especially regarding urban safety and social inequality in non-Western contexts.

Keywords: Fear of crime; Vulnerability model; Past victimization; Neighborhood disorder

Session 4 Data-driven Methods for Urban Issues (Online)

127. A Room of Her Own? Housing Crowding and Gendered Educational Outcomes in China

Authors: Yiqi Huang, Shizhen Wang, Yuhong Wang

Abstract: This paper examines the influence of childhood housing crowding on long-term educational outcomes. We analyze panel data from approximately 3,000 individuals in the China Family Panel Studies (CFPS), tracking their educational and socioeconomic trajectories from 2010 to 2022, spanning their transition from childhood to adulthood. We find that growing up in a crowded home—defined as less than 20 square meters of living space per capita—during adolescence (ages 11 to 15) has a negative impact on years of schooling, after controlling for individual and family characteristics, as well as county and year fixed effects. This effect remains robust across multiple specifications, including alternative definitions of the outcome variable (e.g., university enrollment) and a propensity score matching (PSM) approach. Importantly, the negative effect of housing crowding is not evenly distributed. Girls living with male siblings in overcrowded households face the largest educational penalty—up to 1.5 years of schooling loss—highlighting the compounded disadvantage stemming from gendered spatial allocation. These findings align with long-standing feminist critiques about unequal access to space within the domestic sphere, as articulated by Virginia Woolf in A Room of One's Own (1929). Our evidence suggests that such gendered spatial inequalities persist in contemporary contexts, particularly in space-constrained families. Overall, the results indicate that housing conditions are closely associated with educational and gender inequality in the long term.

Keywords: Housing crowding; Educational attainment; Gender inequality; Adolescence; Living space

160. SCORE: Smart Cities' Organizational Readiness Evaluation for Urban Planning Transformation

Authors: Amay Arora

Abstract: As urbanization accelerates, cities must evolve beyond conventional urban and regional studies to become sustainable, modern, adaptable, resilient, and technological (SMART). This research proposes the SMART Cities' Organizational Readiness Evaluation (SCORE), a multidimensional framework that emphasizes the convergence of community empowerment, digital participatory planning (DPP), and equitable infrastructure. Instead of relying solely on quantitative modeling, urban planning can use artificial intelligence (AI) and digital platforms to enable urban transitions, addressing climate risks while supporting communities. Insights from global urban case studies reveal that successful implementation of SMART Cities depends on fostering collaborative planning practices, cultural sensitivity, and mutual trust. Organizational readiness refers to an urban area's institutional capacity, operational preparedness, and policy alignment to enforce and sustain these initiatives. The research assigns individual SCORE values to SMART cities across each of its five key pillars. First, urban planners can create sustainable programs that leverage real-time data to optimize city functions while prioritizing equity and public value. Second, they can embrace modern urban innovations, like climate-responsive architecture and mobility as a service (MaaS), to enhance habitability and inclusivity. Third, planners can develop adaptable policies that evolve with emerging challenges, facilitating flexible responses to demographic and environmental shifts. Fourth, they can design resilient infrastructure and governance models that proactively manage risks and recover from disruptions through community-led strategies. Finally, urban planners can utilize cutting-edge technology, such as AI, the Internet of Things (IoT), and digital twins, to transform civic engagement and service delivery. This quintuple system offers a roadmap for urban areas seeking to navigate the challenges of climate change, disruptive innovation, and social inequality, promoting the health of smart citizens and the well-being of SMART Cities.

Keywords: Score; Smart cities; Community empowerment; Digital participatory planning; Equitable infrastructure

Session 5 Governance, Planning, and International Perspectives

16. Governance of Municipal Solid Waste in Developing Countries: Insights From Three Bangladeshi Cities

Authors: Shahana Akther

Abstract: Municipal solid waste governance is transdisciplinary and intersectoral. The process involves many institutions, policies, actors, and practices. Collaborative and participatory forms of governance are emerging that emphasize resource recovery and promote circular economies. This study explores how decentralized collaborative participatory governance functions in different local contexts and conditions in Bangladesh's cities. An empirical study was conducted in three Bangladeshi cities: Dhaka, Chattogram, and Gazipur. The study consisted of 50 semi-structured interviews, 3 focus groups, 3 field observations, and secondary data analysis. The megacity of Dhaka and Chattogram is burdened by a high population density, land scarcity, inadequate technology transfer, and bureaucratic complexity. Institutional rigidity has led to lack of adoption of decentralized solutions for sustainable waste management. By contrast, Gazipur's secondary urban system is comparatively more flexible and open, demonstrating enabling factors that contribute to sustainability at local levels.

This study examines how actively engaging with the community, fostering collaboration between local stakeholders and local governments, and implementing a strong monitoring and awareness campaign about waste management benefits can be sustained in densely populated cities like Dhaka and Chattogram. To effectively manage waste in densely populated areas, local solutions need to be tailored to the socioeconomic and geographical circumstances of the area. Decentralizing municipal waste management solutions requires active participation of local stakeholders and collaboration with NGOs, private enterprises, and community-based organizations. This study provides a comprehensive understanding of local waste management practices. This facilitates resource recovery, policymaking, and provides insight into megacities facing similar issues in developing countries. Sustainable resource recovery solutions require more research in local contexts.

Keywords: Waste governance; Collaboration and participation; Waste politics; Resource recovery; Circular economy

103. Methods for the Numerical Evaluation of Deliberative Processes: A Dynamic Model for Capturing Preference Reversals

Authors: John Buckell, Thomas Hancock

Abstract: There is increasing acknowledgement – including from the UK government - of the benefit of employing deliberative processes (deliberative fora, citizens' juries, etc.). Current analytical methods for public debates are qualitative. Evidence suggests that the reporting of deliberative fora are often unclear or imprecise. If this is the case, their value to policymakers could be diminished. In this study, we expand the methods of deliberative processes to numerically document people's preferences, as a complement to qualitative analysis. Data are taken from the National Food Conversation, a nationwide (UK) public consultation on reformations of the food system comprising 339 members of the general public. Each participant attended 5 workshops, each debated its own subtopic of the food system. In each workshop, individuals twice reported responsibility, from 0-10, for changing the food system for 5 bodies (governments, the food industry, supermarkets, farmers, individuals). Analyses examined individuals' perceptions of food system change responsibility. Governments were most responsible and farmers least so. We further assessed variation over time, by workshop content, and by demographics. Across workshops, responsibility changed most for individuals, and least for the food industry. We devise a dynamic choice model to document a reversion effect, where shifts in responsibility within workshops waned over time, with preferences often reverting to pre-workshop levels. Crucially, this effect was less strong for those who abstained from voting, implying that preferences are harder to shift for those who already vote. These results can support qualitative analyses and inform food system policy development. These methods are readily adopted for any such deliberative process.

Keywords: Deliberative processes; Choice modelling; Food system perceptions; Perceptions reversal

Session 5 Governance, Planning, and International Perspectives

121. How Can Citizen-Generated Data Enhance the Capabilities of Environmental Policy Analysis? A Case Study of Urban Water Environment Data Analysis Using the BERT Pre-Trained Model

Authors: Jingjing Cai, Hongchuan Wang

Abstract: Citizen-generated data serves as a crucial foundation for enhancing governmental environmental policy capacity, optimizing policy tool selection, and improving the precision of environmental governance. However, the specific mechanisms through which it influences policy processes remain underexplored. This study integrates the cutting-edge BERT (Bidirectional Encoder Representations from Transformers) language model into policy analysis, using data from the 12345 platform in Fuzhou, China, to investigate how citizen-generated data shapes the environmental policy capacity. The findings reveal that governments employ distinct policy tools in responding to public demands, contingent upon three key factors: institutional trust, public participation willingness, and individual behavioral norms. For populations characterized by high institutional trust, governments tend to employ promotional tools to manipulate public perception. Conversely, citizens with high participation willingness are more likely to encounter rapid formal administrative actions from the government. Notably, for long-term complaints filed by self-interest-sensitive individuals, informational responses rather than formal legal action are typically provided by the government. Furthermore, the influence of public data on policy capacity is mediated through three key mechanisms: focal effects, inertia effects, and cost effects. This study underscores the importance of establishing a robust connection between citizen-generated data and policy capacity, as well as the need to enhance the synergy between emotional governance and policy capacity. These efforts can significantly improve the effectiveness of policy-making supported by information technology.

Keywords: Citizen-generated data; Bert model; Environmental policy capacity; Emotional governance; Mediation mechanisms

150. Multiple Crises Driven by Rare Earth Supply Chains: Synergistic Governance Pathways for Climate Change, Biodiversity Loss, and Resource Equity

Authors: Xuanru Zhou, Gengyuan Liu

Abstract: As critical hubs for green technology deployment, global cities face a paradoxical crisis: Rare earth elements (REEs) underpin decarbonization yet their supply chains exacerbate biodiversity loss, disproportionately affecting urban-adjacent ecosystems. This study examines China's REE supply chain through system dynamics modeling and remote sensing analysis, quantifying compound impacts on climate change, biodiversity, and resource allocation across Shared Socioeconomic Pathways (SSPs). Key findings reveal: 1) Spatiotemporal disparities in carbon emissions and biodiversity loss, with China's domestic REE consumption contributing 29.05%-96% of cumulative biodiversity loss (2000-2060), while export-oriented operations overlap 87% mining zones with biodiversity hotspots; 2) Dynamic climate-ecology tradeoffs – renewable infrastructure achieves carbon-neutral ecological damage by 2035, projecting 7.42×10^7 MSAloss·ha·yr reduction by 2060, yet 18% mines will surpass irreversible soil degradation thresholds by 2040; 3) Supply chain restructuring reduces resource inequity – domestic-prioritized distribution lowers species extinction risks by 34% while maintaining 91% decarbonization targets. Our dynamic accounting framework integrates production, trade, and recycling subsystems to reveal spatial coupling mechanisms between urban renewable demand and mining-area ecological vulnerability, identifying critical intervention nodes like wind turbine lifecycle management. This research provides data-driven decision tools for cities to address the tripartite challenge of climate action, biodiversity conservation, and equitable resource governance, demonstrating optimized supply chains can reconcile SDG conflicts and enable resilient urban transitions.

Keywords: Climate change mitigation; Biodiversity loss; Supply chains; Synergistic governance

Session 5 Governance, Planning, and International Perspectives

187. The Era's Mission of Metropolitan Area Governance: A Review of Experiences in China's Metropolitan Areas

Authors: Lin Tian, Shangwu Zhang

Abstract: Metropolitan areas in China are not only a major form of urbanization and economic growth poles, but also a governance tool for high-quality regional development and an essential platform for participating in global competition. Through extensive research literature, planning materials and practice cases, this study traces the origins and background of metropolitan areas in China, and then overviews the related research and planning practices since China's reform and opening-up. It concludes the development into four stages: 1) early research and local explorative practice, 2) beginning of national attention to regionalization phenomenon, 3) optimization of the national spatial system, and 4) spatial governance construction under the new development paradigm. It finds that the connotation of metropolitan areas has evolved with the urbanization and socio-economic development of the country, having distinct policy focuses at each stage. Despite its Western origin, China's metropolitan area concept has developed localized characteristics, i.e., the dual nature of a "spatial phenomenon" and an "object of planning". China's "metropolitan area model" is a suitable strategic choice at the current and certain stages in the future, for addressing regional coordination, the "big city disease" and urban-rural integration. However, challenges remain in practice, including insufficient involvement of the higher governments in the overall regional governance system, divergence of interests among local governments, and lack of participation of market and social actors, hindering the reorganization of national-local power allocation. Finally, it emphasizes the mission of the era of China's metropolitan areas and builds a trinity framework of national strategy, regional synergy and scientific governance. Guided by national strategy, metropolitan areas should promote high-quality urbanization and regional integration through spatial planning and the establishment of cooperation platforms, coordination mechanisms, and evaluation systems.

Keywords: Metropolitan areas; Urban governance; Regional development; Spatial planning; China urbanization

197. When Green Meets Bureaucracy: Institutional Logics, Fragmented Authority, and the Governance of Sustainable Finance in Indonesia

Authors: Fauziah Yuniarti

Abstract: Amidst overlapping crises of climate change, inequality, and development pressures, sustainable finance has emerged as a critical policy tool to steer capital toward resilient and low-carbon futures. Yet in emerging economies like Indonesia—where governance systems are layered, and institutional coordination remains fragmented—the promise of sustainable finance is entangled with bureaucratic complexity, conflicting priorities, and uneven regulatory capacity.

This research investigates how Indonesian state actors conceptualise and govern sustainable finance—particularly through instruments such as green bonds, green sukuk, and blended finance—and how institutional logics and power dynamics shape these governance processes. It draws on a planned 30 elite interviews (15 completed at the time of writing) with policymakers, regulators, and non-state actors, alongside content analysis of national planning documents and presidential debates. This dual approach captures both discursive and institutional configurations that define Indonesia's financial response to climate and development challenges.

The study maps how fragmented authority among key state actors—such as the Financial Services Authority, the Central Bank, and the Ministry of Finance—and competing logics (developmental, fiscal, environmental) complicate efforts to align sustainable finance with climate targets and the SDGs. It also examines the political and performative roles of classification systems through Indonesia's recent shift from a Green Taxonomy to a broader Sustainable Finance Taxonomy, revealing how these frameworks shape financial flows and investor confidence.

Contributing to urban-financial geographies, this work shows how national financial governance intersects with urban resilience planning in polycrisis contexts—where environmental, fiscal, and institutional risks converge. It offers a Global South perspective on the data-informed governance of climate finance and presents methodological insights for evaluating cross-sector sustainability policy.

Keywords: Sustainable finance; Institutional governanc; Fragmented authority; Polycrisis; Urban financial geographies

Session 6 Infrastructure, Connectivity, and Spatial Economics

61. Underground Humanity: On the Electrification of the London Underground and Its Impacts

Authors: Yanwen Liao

Abstract: The electrification of the London Underground offers a micro-level case for examining energy transition and urban co-evolution. Commissioned in 1863 as the world's inaugural subterranean railway, the system initially depended on on-site power stations such as Lots Road and Greenwich for self-generated electricity. This autonomy persisted until its integration into the National Grid in 2000, marking a transition from coal to oil, gas, and centralized supply, and underscoring the pivotal role of national governance and regulatory frameworks.

Innovations in electric traction and ventilation technologies mitigated steam-era pollution, while the system's externalities manifested spatial spillover effects and dynamic interactions with urban air quality and temperature. Electrification facilitated network expansion, reshaped commuting patterns, promoted suburban decentralization, and enhanced socioeconomic accessibility. Moreover, the Underground's tunnels served as critical wartime shelters, illustrating the transport network's multifaceted contribution to urban resilience.

Fuel transitions were driven by miners' strikes, petroleum industry scaling, North Sea oil development, and environmental legislation, revealing the interplay among political imperatives, economic rationality, and ecological cost. Drawing upon London Underground archives and interdisciplinary scholarship, this study interrogates the tensions between technological advancement and ecological impact, framing transport systems as integral components of urban resilience and offering historical insight for contemporary sustainable mobility initiatives.

Keywords: Urbanization; London underground; Electrification; Energy; Pollution

68. Transportation Evolution and Spatial Economic Restructuring: A Spatiotemporal Analysis of the Chengdu-Chongqing Highway's Impact (1930s–1940s)

Authors: Qinya Huang

Abstract: The cross-regional extension of modern transportation infrastructure frequently triggers structural reorganization of traditional spatial patterns and economic systems. This study investigates the Chengdu-Chongqing Highway and its associated urban clusters during the 1930s-1940s, employing GIS spatial analysis to reconstruct the modernization process of the Chengdu-Chongqing region's composite water-land transportation network. Through spatial econometric methods, this study analyze the configuration characteristics between central place systems and transportation networks, while utilizing gravity models to quantitatively assess hierarchical shifts in central places following the highway's completion. Findings reveal that the Chengdu-Chongqing Highway significantly reinforced the status of Chengdu and Chongqing as regional economic cores. Functional reorganization of transportation nodes induced transformative effects on the regional urban hierarchy: hub cities at water-land transshipment nodes, particularly Zigong and Neijiang (as salt and sugar production and Transshipment centers), achieved hierarchical ascension. Conversely, market towns (changzhen) dependent on low-speed transportation experienced economic decline due to diminished locational advantages. Through strategic utilization and reorganization of existing transportation networks, pre-modern economic elements became integrated into broader regional urban systems and connected with national transportation trunk lines. This study provides a historically grounded empirical case for analyzing the interdependent relationship between transportation development and spatial-economic dynamics during modernization processes.

Keywords: Chengdu-chongqing highway; Spatiotemporal analysis; Gis analysis; Composite water-land transportation network

124. Research on the Impact of Differentiated Supply of Industrial Land in China on Total Factor Productivity and Its Spatiotemporal Heterogeneity

Authors: Jian Wang, Yun Li, Haixia Wei, Qun Wu

Abstract: Optimizing resource allocation is one of the main paths to improve total factor productivity (TFP). As a means of industrial land resource allocation, the differentiated supply of industrial land has what kind of impact and spatio-temporal differences on industrial TFP, which is related to the optimization of territorial spatial layout and the promotion of high-quality industrial development. In-depth research is urgently needed. Based on this, this paper adopts the panel data of 282 prefecture-level and above cities across the country from 2007 to 2021, including 700,000 pieces of industrial land transfer data, to construct the Spatial Durbin Model (SDM), and examines the impact of differentiated supply of industrial land by local governments on industrial TFP and its spatio-temporal differences. The results show that: (1) The degree of differentiated supply of industrial land shows a weakening trend in time, and it is characterized by "weak in the East and strong in the west" in space; Industrial TFP shows an increasing trend in time and a "high in the East and low in the west" feature in space. (2) At the national level, the increase of differentiated supply of industrial land is not conducive to the improvement of industrial TFP, and the impact has an increasing trend. (3) In terms of spatio-temporal differences, there are significant disparities among different regions (east, central, west, and north and south), river basins (the Yangtze River Economic Belt and the Yellow River Basin), and urban agglomerations (the eight major urban agglomerations), and these differences become increasingly larger as the research spatial scale decreases. Therefore, it is urgent to explore the industrial land supply policy in accordance with local conditions and time conditions to support high-quality industrial development.

Keywords: Land economy; Land market; Industrial land; Industrial tfp; High quality development

133. The Spatially Differentiated Impact of High-Speed Railway on Accessibility and Socio-Economic Development of Developing Regions: A Study in Southwest China

Authors: Rui Zhou

Abstract: The high-speed railway (HSR) plays a crucial role in bolstering regional connectivity and economic and social progress. Nevertheless, there is an ongoing debate around the impact of HSR on the economic and social development of the developing regions. On one hand, developing regions necessitate the implementation of HSR systems to facilitate their progress. On the other hand, they must also mitigate the potential drawbacks and adverse consequences associated. By employing accessibility analysis, urban potential analysis, and geographically-temporal weighted regression modeling, this study aims to comprehensively elucidate the spatially variable impact of HSR on developing regions such as Southwest China. The findings indicate that the implementation of HSR has yielded significant benefits in terms of accessibility, economic growth, and social development in developing regions. However, there is a growing disparity between cities that have HSR connections and those that do not. Additionally, smaller and medium-sized cities situated along the middle section of the HSR route experience relatively less pronounced impacts. This study posits that there is a necessity to enhance the expansion of the HSR network in developing regions, concurrently with the reinforcement of inter-city cooperation and the establishment of urban agglomerations, thereby promoting high-quality and balanced development of the developing regions.

Keywords: High-speed railway; Regional accessibility; Urban potential; Gtwr model; Southwest china

Session 6 Infrastructure, Connectivity, and Spatial Economics

202. The Impact of Built Environment on Shared Bicycle Route Choice in Metro Travel: A Case Study of Shenzhen

Authors: Jinyi Yu

Abstract: This study examines the influence of various built environment factors on shared bicycle route choices within metro-linked travel in Shenzhen City, China. As shared bicycles play a crucial role in facilitating first-mile and last-mile connectivity for metro commuters, understanding how urban environmental characteristics affect route selection can offer insights for more integrated transit planning. By analyzing trip data of shared bicycle users traveling to and from metro stations, we investigate the effects of factors such as road width, street connectivity, greenery levels, land-use types, and pedestrian infrastructure on cyclists' route preferences. Utilizing Geographic Information Systems (GIS) for spatial data processing and applying machine learning models, including Random Forest and Logistic Regression, we identify significant correlations between built environment attributes and route choices within metro journeys. Findings indicate that routes with wider roads, higher greenery coverage, better connectivity, and mixed land use are preferred by users integrating shared bicycles with metro travel. These insights provide valuable guidance for urban planners and policymakers to optimize cycling infrastructure and urban design, promoting sustainable and efficient first-mile and last-mile solutions in rapidly urbanizing contexts like Shenzhen.

Keywords: Built environment; Shared bicycle; Route choice; Mobility

220. Exploring the Impact of Cycling Infrastructure on Property Price in Shenzhen

Authors: Zhaoqi Zhou, Tim Schwanen

Abstract: The relationship between cycling infrastructure provision and property prices has been widely debated due to its implications for gentrification. However, empirical evidence remains limited and often inconsistent. Existing studies are predominantly cross-sectional, frequently overlooking the temporal and spatial dynamics of such effects. To address these gaps, this study examines the impact of cycling infrastructure on property prices in Shenzhen, China, from 2010 to 2020. Employing a series of spatial lag models grounded in quasi-experimental and difference-in-differences approaches, we find that new cycling infrastructure in Shenzhen had an overall positive effect on property values in surrounding neighbourhoods. Notably, segregated cycle lanes had an effect that is approximately twice as large as that of non-segregated ones. This impact is more pronounced in the outer areas of Shenzhen and became stronger after 2015 when dockless bicycle sharing was introduced. The effect also appeared to be time-lagged, suggesting that new cycle lanes may signal broader neighbourhood transformation processes that lead to mid- and long-term property price increases and potential gentrification. These findings offer insights for more effective and equitable cycling infrastructure planning that takes broader urban development and gentrification mitigation strategies into account.

Keywords: Cycle lane; Infrastructure; Property price; Difference in difference modelling; Gentrification; Shenzhen

Session 7 Production of Space and Urban Justice

92. Understanding the Financed Whole Life Carbon Emissions: GHGs Emissions Associated With Residential Mortgage Loans in Hong Kong From 2000 to 2020

Authors: Liang Dong

Abstract: The examination of greenhouse gas emissions resulting from financial operations within supply chain, known as financed emissions, is imperative. One critical sub-field is to address whole life carbon in real estate sector, which is referred as the greenhouse gas emissions (GHGs) emitted over the life cycle of a building or infrastructure asset. This study performed as a first try to account the financed emissions associated with residential mortgages from 2000 to 2020 in Hong Kong, a representative high-density city in terms of both population and capital. We adapted the methodology from well recognized guidance by the Partnership for Carbon Accounting Financials, with improvement on considering the whole life carbon. Research results show that the overall carbon emissions of Hong Kong residential properties increased significantly from 2000 to 2020, but the fluctuation of attribution factors decreased. Specifically, financed emissions rose from 4.64 million tons in 2000 to 17.54 million tons in 2020. This study provides empirical support for the complex relationship between residential mortgage lending and financed emissions and provides valuable insights into developing more environmental friendly and sustainable financial policies.

Keywords: Residential mortgages; Financed emissions; Climate-related disclosures; Whole life carbon emissions; Hong kong

105. Obedient Communities and Urban Erasures: Everyday Urbanism in Taipei's Military Dependents' Villages Under Financialised De-Militarisation

Authors: Yu-Tung Wu, Stephen Hincks, Ryan Powell

Abstract: Through the lens of everyday urbanism, this study examines how residents of Taipei's Military Dependents' Villages (MDVs) have responded to and adapted amid drastic transformations in governance structures and residential space. These settlements were established in the late 1940s to accommodate hundreds of thousands of war-displaced migrants and refugees with military affiliations, along with their families. For decades, the military state not only governed but also participated in multiple dimensions of residents' everyday lives, and distinctive spatial arrangements, governance structures, and lived practices were shaped within the MDVs. This lifestyle began to unravel in the late 1970s, when a state- and military-led process of financialised de-militarisation unfolded through demolition, relocation, and reconstruction. Employing a mixed-methods approach, combining secondary documentary analysis, field observations, and semi-structured interviews with residents, this study explores the influence of financialised policies on residents' daily experiences, perceptions, and housing ideologies. It further examines how individuals negotiated the transition to a new socio-spatial order, often through adaptation, acceptance, and limited forms of resistance. Empirical findings indicate that financial logic-driven policies neglected the informality, distinctive governance modes, and socio-cultural specificity of the MDVs, instead promoting a process of normalisation and standardised social integration. However, the long-standing experience of militarised everyday life cultivated a deep sense of trust in and obedience to the military state, which in turn shaped residents' tendency to "self-simplify" and accept the significant spatial and social transformations brought about by de-militarisation. These adaptive responses, grounded in a unique historical and cultural trajectory, challenge dominant narratives of resistance and provide nuanced international insights into the everyday effects of financialisation. They also underscore the importance of accounting for historically embedded state-citizen relations and daily life practices in understanding urban policy outcomes.

Keywords: Military dependents' villages; De-militarisation; Financialisation; State simplification; Taiwan

Session 7 Production of Space and Urban Justice

110. Equity-Focused Evaluation of Urban Heat Mitigation Policies: Evidence From Housing-Related Exposure in Phoenix, USA

Authors: Wensen Luo, Qian Shi, Chao Xiao, Xingzi Zhang

Abstract: As global warming accelerates, the intensity and frequency of heatwaves have risen worldwide in recent years, posing significant threats to urban infrastructure and triggering cascading disruptions. Buildings serve as critical physical infrastructure, insulating occupants from extreme outdoor temperatures and supporting human livelihood and productivity. However, disparities in housing conditions can result in pronounced differences in thermal performance, particularly under polycrisis scenarios such as simultaneous heatwaves and power outages. In response, local governments and organizations across the U.S. have established cooling centers as an emergency measure to provide air-conditioned spaces and mitigate heat exposure, especially for vulnerable populations. Nevertheless, concerns persist regarding the equity and effectiveness of these facilities in addressing housing-related heat risks during such compound events. This study investigates spatial justice issues in the distribution of cooling centers by analyzing urban-scale building performance. Building simulations were conducted using EnergyPlus, incorporating microclimate conditions derived from urban morphology analysis. Subsequently, the accessibility of cooling centers for individual buildings was evaluated using a gravity-based model. Pearson correlation analysis was then employed to examine the relationship between building performance indicators and accessibility metrics, assessing whether the spatial distribution of cooling centers adequately addresses housing-related vulnerabilities. Applying this equity-focused evaluation approach to Phoenix, USA, we found that the current distribution of cooling resources does not sufficiently correspond to housing-related exposure risks, as no significant correlations were observed between building performance and accessibility metrics. Moreover, substantial disparities were identified, exacerbating the mismatch between supply and demand: the maximum variation in building performance indicators reached 319%, and while the maximum accessibility score was 699, 27% of buildings had an accessibility score of less than 1. These findings offer valuable insights for optimizing facility siting and enhancing emergency management strategies in response to extreme heat events, ultimately promoting more equitable urban heat mitigation policies.

Keywords: Cooling resource allocation; Equity-focused urban policies; Housing-related exposure; Climate change adaptation; Extreme heat events

119. People as Spectacle: A Case Study of Downtown Cairo

Authors: Lojine Hanoun

Abstract: Following the Egyptian state's Vision 2030 announced in 2017, Cairo has been undergoing fundamental changes including urban restructuring, an influx of foreign investments, gentrification and sanitization of space. Currency depreciation, the withdrawal of state subsidies, and rising inflation lates have led to a dwindling middle class and a widening economic gap both reflected in and reflective of the lived experience of Cairo inhabitants amidst the restructuring of the city.

Downtown Cairo is literally and figuratively central to such changes, as the geographical center of the capital tying the new developments in East and West Cairo, and as the heart of the 25th of January Revolution and a key target of the state's erasure policies.

This paper discusses the entanglement of neoliberal spatial structuring, economic state policies, and the omnipresence of the military state in the urban sphere with the transformation of people and their everyday lives into a consumable spectacle in Downtown Cairo. Through an ethnographically-informed account, I argue that the confluence of aforementioned events has created a spatial structure in which everyday conditions such as the routine work of street vendors or the afternoon tea at a street café by working class students become carefully-situated and curated displays of authenticity for the consumption of suburban Cairenes and non-Egyptians. However, as working-class Cairenes exchange the gaze, a reciprocal reinforcement of the "Other" takes place, echoing the proliferating spatial divisions in the city.

This paper is based on (ongoing) ethnographic fieldwork conducted in Downtown Cairo between September 2024 and October 2025. Methods employed in data collection include participant-observation, semi-structured walking interviews, affective mapping exercises, and Irving's (2011) life-journey method.

Keywords: Inequality; Spectacle; Urban development; Class

Session 7 Production of Space and Urban Justice

194. High-Resolution Mapping of Material Stocks in the Urban Built Environment in China

Authors: Zhenfeng Shao, Bowen Cai, Xiaoyu Zheng, Xiongjie Deng

Abstract: Material stock refers to the fundamental materials that constitute the foundation of socio-economic metabolism, especially in the interactions between the natural environment and human society. A recent study published in Nature reveals that by 2020, the total amount of anthropogenic materials has surpassed the total mass of natural materials. The accounting of material stock in the built environment typically follows two classic models: the flow-driven model and the stock-driven model. The main contents of this report include: requirements on mapping material stocks in the built environment, and the authors will focus on the methods on building height mapping, material stock mapping and embodied carbon mapping of urban built environment. This report will focus on the scientific issues on monitoring urban material stock with stock-driven model in China. And the methods on mapping building height, material stock and embodied Carbon will be introduced. The future work include investigating the relationship between built environment material stocks and service/well-being, and exploring carbon reduction strategies from the perspective of lifecycle building material embodied carbon emissions.

Keywords: Urban data analysis; Material stocks; Urban built environment; Climate adaptation; Public policy

198. Last to Own, First to Pay: Rising Housing Costs Across Population and Neighborhoods in Germany

Authors: Oana Garbasevschi, Andreas Peichl, Hannes Taubenböck

Abstract: Germany is the EU27 country with the lowest rate of homeownership, a situation fueled by a long period of rent stagnation, high construction activity, and low population growth. Since 2010, a tightening housing market, coupled with rising housing costs – especially maintenance, rents, and heating – increased the expenditure burden for a large share of households, and presumably in a disproportionate manner for vulnerable groups such as seniors, young and single households, and foreigners.

We aim to investigate this question using the openly available Census, a high spatial resolution data source published in 2011 and 2022. The combination of demographics and attributes of the residential building stock - such as heating type and source, age and morphology - together with homeownership and rent values, has the potential to depict a rich picture of rising housing costs and affected population groups.

Preliminary results show significant geographic variation across federal states in terms of residence ownership, in high-rent neighborhoods within medium and big cities, of households with 4 persons or more, foreign citizens, and senior citizens over 65. Single households are more likely to own residences in rural municipalities and small cities. Concerning the building stock, residence ownership is strongly correlated with the construction of new buildings in low-rent neighborhoods in most eastern states and in many small cities in western states. Furthermore, the relationship between residence ownership and residential heating source presents high regional heterogeneity.

In further explorations we examine the dynamics of population and building stock changes, made possible by the two Censuses covering a period of significant transformation in both population and housing market trends. Last, by keeping the focus on the Census, we wish to highlight the relevance of open data publication by national statistical offices, and the importance of statistics with high spatial granularity.

Keywords: Housing costs; Neighborhoods; Vulnerable population

Session 8 Accessibility, mobility, and travel behaviours

66. Understanding Phenomenon of Weak Emergence in Complex Adaptive Systems Through GPS Bus Data

Authors: Rati Sandeep Choudhari

Abstract: Bhubaneswar's Mo Bus system is a smart/ intelligent public transport system, which is highly organised and regulated. The buses, runs on fixed routes and follow fixed timing, with a dedicated bus frequencies on each of the operational routes. Despite being a highly formalised transport system, externalities like traffic congestions, bus breakdowns, weather conditions, etc, often causes bus delays and disruptions in bus frequency on a day-to-day basis. As a result, the actual/ on-ground service characteristics is more dynamic and adaptive than how the system has been planned in theory. These day-to-day delays and disruptions, causes emergent patterns within the bus system, which leads to the phenomenon of internal adaptation and weak emergence. This pushes the system to evolve and adapt over time. This presentation is a part of a wider PhD, which aims to understand the impact of the phenomenon of internal adaptation and weak emergence within the urban mobility system of Bhubaneswar to understand the space-time inequities generated and the resultant outcomes of place-based urban accessibility in city's neighbourhood. This presentation will primarily focus on the phenomenon of weak emergence occurring due to day-to-day shifts in spatial-temporal dynamics of the planned service characteristics of the system. Mo bus GPS data set for a period of one month (20th March-20th April 2025) obtained from Capital Region Urban Transport, Bhubaneswar, has been analysed to capture emergent patterns occurring due to day-to-day shifts in bus schedules and frequencies in Bhubaneswar.

Keywords: GPS bus data set; Complex adaptive systems; Emergent patterns

85. Inclusive Proximity: A Perceived Walkable Neighborhood Framework to Analyze the 15-Minute City

Authors: Janus Leonhardt, Ricardo Hurtubia

Abstract: The 15-Minute City has emerged as a key concept for rethinking urban accessibility. Standard approaches often rely on objective time- or distance-based metrics that overlook the heterogeneity of individual abilities, preferences, and perceptions. This oversight can inadvertently reinforce socio-spatial inequalities and undermine the goal of creating inclusive urban environments. To address these limitations, this paper introduces an analytical framework for evaluating the 15-Minute City concept based on the Perceived Walkable Neighborhood (PWN), defined as the subjective spatial threshold of an individual's pedestrian-accessible urban environment, influenced by the interplay of personal attributes, behavioral patterns, and environmental factors.

An empirical approach in Santiago de Chile is presented, based on a geo-referenced survey (n=1,056) in which respondents traced their PWN. The observed walking thresholds (μ=16.5min; σ=8.8min) validate the 15-minute heuristic yet reveal substantial heterogeneity, contracting to 12.6min for older adults and 10.6min for mobility-impaired individuals. When each PWN is intersected with a 150m hexagonal grid enriched with land-use and perceptual attributes, an individual-hexagon panel dataset is generated for the estimation of a discrete choice model to predict the probability that a hexagon is included as part of an individual's PWN. Our results show that each additional 100m of walking distance reduces the odds of a hexagon being included by 18% on average (19% for older adults, 22% for mobility-impaired individuals, and 17% for women). Conversely, the presence of a metro station increases those odds by 47%, and a 10% expansion in commercial area yields a 0.5% uplift. Other covariates produce directionally consistent but smaller effects, with perceived safety increasing inclusion likelihood; and industrial uses, barriers, and higher monotony reducing it. By analyzing how diverse residents delineate their PWN, this framework enables to uncover crucial insights into what constitutes meaningful accessibility across different socio-spatial contexts.

Keywords: 15-minute city; Inclusive proximity; Perceived walkability; Accessibility

Session 8 Accessibility, mobility, and travel behaviours

163. EV vs ICEV Users: A Multilevel Comparison of Travel Behaviour

Authors: Hao Zhang

Abstract: Anticipating the large-scale electric vehicle (EV) adoption in the UK and beyond, understanding the travel behaviour of EV and internal combustion engine vehicle (ICEV) users has been a key research topic. While existing studies tend to compare EV and ICEV usage at either the individual or household level, systematic comparisons that simultaneously consider both levels and their potential interactions remain limited. Using England National Travel Survey data series (2010–2019 and 2022–2023), we compare travel behaviour of 1,500 EV drivers and 1,300 corresponding EV households to their ICEV counterparts. Tobit model results show longer travel distance and duration for individual EV drivers but not for EV households compared to their ICEV counterparts, which implies intra-household mechanisms may moderate the induced demand. EV drivers and households are associated with lower bus usage, highlighting the policy challenge of promoting EV uptake without undermining public transportation and entrenching car dependence.

Keywords: Electric vehicle; Travel behavior; Travel mode; Travel pattern; Temporal pattern

203. Exploring the Potential of Large Language Models (LLMs) in Analyzing Passengers' Perceptions of Transit Service Quality

Authors: Shuli Luo, Ying He

Abstract: Public transit systems are essential to urban mobility, affecting millions of daily commuters. To develop a more responsive, equitable, and efficient public transportation system, it is crucial for transportation planners and policymakers to gain a comprehensive understanding of the diverse travel experiences of transit users. Social media platforms offer valuable, continuous feedback, enabling transit providers to identify issues, make real-time adjustments, and plan long-term improvements. Recently, large language models (LLMs) have attracted significant attention in the urban planning field due to their exceptional performance in natural language processing (NLP) tasks. Using a Weibo dataset related to the Shenzhen metro system (2018-2019) in China, this study developed a two-stage analysis framework to evaluate LLMs' capabilities in transit service management acting as customer experience analyst and transport planner respectively. In particular, we employed LLMs including GPT-3.5 and GPT-4o, utilizing zero-shot, few-shot, and chain-of-thought prompting techniques. Our findings demonstrate that LLMs consistently excel in classification task and policy recommendation task when benchmarked against the traditional Bag of Words (BOW) model. The systematic error analysis revealed three types of hallucinations: overthinking, lack of context learning, and ambiguity errors. Despite these challenges, this research underscores the potential of LLMs in enhancing transit service quality assessment and emphasizes the importance of domain expert rationale in designing prompts and interpreting results. Our study offers valuable insights for transportation planners aiming to leverage advanced NLP techniques for more responsive and data-driven service improvements.

Keywords: Transit service quality; Metro system; Large language models; Natural language processing

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205. The Relationship Between Active Travel and Green Spaces: A Case Study of Shanghai

Authors: Jinjing Hu

Abstract: Active travel can effectively promote human physical and mental health, optimize urban transportation, promote green and healthy urban life, and is currently a more advocated mode of transportation. Active travel usually includes cycling and running. Studies have shown that people tend to engage in active travel in more natural and green spatial environments. However, current research has not yet delved deeply into the relationship between active travel and green spaces, especially in high-density cities where green resources are relatively scarce. Further exploration of the relationship between active travel and green spaces will help to more fully utilize existing green resources, thereby promoting spatial efficiency and fairness. Therefore, this article takes Shanghai as the research area. Explored the relationship between active travel, such as walking and cycling, and the spatial distribution of green spaces in Shanghai. Firstly, we conducted GIS spatial analysis on the cycling and running datasets, analyzing the spatial layout patterns of active travel activity intensity within the city. Then, we analyzed the connectivity, accessibility, quality, and other characteristics of green spaces, and used regression models to analyze their correlation with active travel. The results indicate that active travel is more concentrated around accessible and well-connected green spaces, and there are significant spatial differences between districts, which are also influenced by the characteristics of green spaces themselves. Finally, based on the analysis results of this article, we will discuss and attempt to propose corresponding optimization suggestions for urban green spaces. The results of this study provide insights for urban planners to strengthen green infrastructure and encourage sustainable transportation.

Keywords: Active travel; Green spaces; Cycling; Running; High-density cities

208. Perceived Safety in Shared Micromobility: A Multi-City Analysis of User Concerns and Behavioral Implications

Authors: Rosalia Camporeale, Vincenza Torrisi, Pengxiang Zhao, Chunli Zhao

Abstract: Micromobility has emerged as a key component of urban transportation, offering sustainable and flexible solutions for first- and last-mile connectivity. However, despite its advantages, their widespread adoption is hindered by concerns over infrastructure, service availability, regulatory challenges, and, most notably, perceived safety. While previous research has focused on objective safety risks and last-mile applications, the influence of perceived safety on shared micromobility (SMM) adoption remains underexplored.

This study addresses this gap by analyzing how perceived safety shapes user behavior and adoption patterns across three European cities—Utrecht (Netherlands), Manchester (UK), and Malmö (Sweden). Using Factor Analysis and Binary Logistic Regression, we identify key determinants of perceived safety across transport modes. Additionally, GPS-based travel diary data provide insights into real-world mobility choices, allowing for a comparison between stated perceptions and actual travel behavior. Our findings reveal significant variations in safety perceptions based on city-specific infrastructure, user demographics, and levels of public trust in shared mobility services.

The results highlight the need for targeted interventions, including infrastructure improvements, regulatory measures, and public engagement initiatives, to enhance user confidence in SMM. These findings offer actionable insights for urban planners and policymakers, emphasizing the importance of integrating micromobility with public transport, improving safety regulations, and fostering a data-driven approach to mobility planning.

Keywords: Sustainable mobility; Traffic safety perception; Factor analysis; Binary logistic regression; Travel diary; User behaviour

Session 9 Mobility Equity and Accessibility

23. Drivers and Barriers to Equitable and Sustainable Mobility in Latin America: The Case of Lima and Santiago

Authors: Andrea Costa-Allendes

Abstract: Latin America is one of the most urbanised regions and is also home to several of the world's largest cities. A major challenge is addressing the mobility needs of millions of residents, essential for accessing economic opportunities and services. Latin American cities also face climate change, economic inequality, and public health challenges. Moreover, decades of weak urban planning frameworks have led to uncontrolled urban sprawl and spatial segregation. Social housing and self-built areas often lack services and infrastructure, disproportionately affecting lower-income residents. While these issues increase the complexity of improving mobility, mobility can also intensify social, economic, and environmental challenges. An interdisciplinary approach is essential for comprehending these interconnected and mutually reinforcing crises.

Equitable and Sustainable Mobility (ESM) is defined as a mobility system that promotes active travel (i.e., walking, cycling) and public/collective transport as alternatives to private car use. ESM aims to address mobility needs in an equitable, sustainable, and efficient way. Despite the extensive research on mobility in the region, the literature lacks a comprehensive analysis of the drivers and barriers that shape ESM.

To address this gap, the research examines ESM in Lima, Peru and Santiago, Chile. Semi-structured interviews were conducted over six months of fieldwork. Policymakers, academics, and experts provided insights into the factors that influence mobility transitions. The findings indicate that institutional capacity, governance, political economy, finance and urban planning are key drivers and barriers. Studying these factors deepens our understanding of mobility dynamics and helps identify areas for policy intervention.

Additionally, this research aims to conduct a quantitative exercise to inform a proposal for mobility reform in Lima. AI and modelling tools can integrate datasets, simulate transport and investment scenarios, and analyse costs, benefits, business models, and financing schemes. Integrating qualitative and quantitative analysis can provide valuable insights to accelerate ESM.

Keywords: Equitable and sustainable mobility

44. Scaling Effects of Intra-City Human Mobility Resilience Patterns Under Extreme Weather

Authors: Yan Zhang

Abstract: Extreme weather events, intensified by climate change, pose escalating threats to intra-city mobility and overall urban functionality. While constructing resilient mobility networks is essential for climate adaptation, our understanding of multi-scale mobility dynamics under extreme weather remains limited, particularly regarding cross-scale interactions under such stressors. In this study, we propose an integrated framework combining fluctuation detection, resilience quantification, and coupling analysis to examine the scaling effects of mobility disruptions during Typhoon Bebinca (No. 2413) in Shanghai. Using high-accuracy mobile signaling data, we construct multi-scale networks at three levels: inter-community, inter-subdistrict, and inter-district. The spatiotemporal evolution and clustering of mobility disruptions are analyzed, with resilience patterns and mechanisms quantified using the resilience curve, the power law model, and causality testing. Results indicate that mobility disruption severity amplifies with spatial scale, with minimum hourly mobility dropping to 68%, 36% and 24% of baseline levels from smaller to larger scales. Mobility changes exhibit significant correlations with meteorological conditions and spatial location. Resilience indicators exhibit scale-dependent statistical characteristics, ranging from normal to skewed and power-law distributions. Notably, cross-scale coupling analysis reveals a directional shift in flows from larger to smaller scales during the event, while cascading failures at finer scales impede recovery at broader levels. These findings highlight the asymmetric and interconnected nature of urban mobility resilience, offering actionable insights for scalable, data-driven urban planning and emergency response strategies under compound climate threats.

Keywords: Extreme weather; Mobility resilience; Multi-scale network; Data-driven method

Session 9 Mobility Equity and Accessibility

45. A Theoretical Framework for Transport Accessibility Thresholds Informed by the Capabilities Approach

Authors: Camila Ramos, Tim Schwanen

Abstract: Accessibility in the realm of transport planning is hardly a new concept; its origins in transport literature can be traced back to Hansen's pioneering work in 1959. While definitions vary, the most widely accepted describes accessibility as the potential for opportunities for interaction—essentially, what people are able to do.

A major challenge in applying accessibility measures in transport studies is the lack of clarity around how to define the level of accessibility that people ought to have, and below which they may struggle to function within society. Although there are myriad studies on the potential impacts of low or unequal levels of accessibility, few have sought to develop a framework for establishing accessibility thresholds that take into account individual-specific circumstances. Defining such thresholds is essential for understanding the consequences of accessibility levels in relation to social disadvantage and social exclusion.

This paper proposes a theoretical framework grounded in Sen's Capabilities Approach, adapting its philosophical foundation to the field of transport accessibility. The aim of this research is twofold: i) to offer a theoretical framework outlining the conditions that transport academics and practitioners should consider for something that is physically accessible to also constitute a real opportunity; and ii) to provide resources and procedures for adapting existing accessibility measures in the spirit of Sen's work.

Keywords: Accessibility; Accessibility thresholds; Transport justice; Transport policy; Capabilities approach

120. Assessing the Impacts of On-Demand Transit on Urban Mobility and Equity: A Study of Hong Kong

Authors: Xiaohang Ruan

Abstract: This research investigates the emerging concept of on-demand transit (ODT) and its potential to transform urban mobility in Hong Kong. Specifically, this research uses the Red Minibuses in Hong Kong as the key example. As traditional public transportation systems face declining ridership and struggles with accessibility, ODT offers a flexible, user-centered alternative that can address critical transportation challenges. This study examines the socio-economic profiles of potential ODT users, evaluates the relationship between ODT and existing public transit modes, and assesses the impact of ODT on transport equity. this research highlights how ODT can enhance service efficiency while promoting sustainability and social inclusion. The proposal outlines three primary research questions: who the potential users of ODT are, what role does ODT play in multimodal transit options, and how does it influence transport equity among various demographic groups. the research will utilize data from the Hong Kong Travel Characteristics Survey. Descriptive statistics will be employed to summarize socio-economic and trip characteristics of potential users of on-demand transit. Additionally, comparative analyses will highlight differences between ODT users and other public transit users. a Structural Equation Model (SEM) will be employed to examine the complex effects of RMB usage on transport equity. The SEM framework will facilitate the exploration of relationships among multiple variables, allowing for the assessment of both direct and indirect effects.

Keywords: Sustainable transport

Session 9 Mobility Equity and Accessibility

161. Causal Inference and Machine Learning Synergy: Mobile Signaling Big Data Unveils Built Environment Heterogeneity in Older Adults' Post-COVID-19 Walking Resilience

Authors: Chengcheng Liu

Abstract: This study responds to the polycrisis of urban mobility and public health by developing an innovative data fusion framework that combines mobile phone signaling big data (capturing 1.63 million travel records) with machine learning-processed street view imagery. While existing studies have confirmed significant disruptions to their walking behavior during the COVID-19 pandemic, the causal effects of pandemic-related policies on recovery trajectories remain underexplored, with how neighborhood-level built environments influence these dynamics. This study leverages five months of mobile phone signaling big data and develops a quasi-experimental interrupted time series (ITS) model to track changes in older adults' walking time during and after the pandemic. We integrate traditional 2D urban built environment metrics with deep learning-derived 3D perceptual indicators, using the SegNet deep convolutional neural network (CNN) to automatically extract green view index (GVI) and sidewalk ratios (SR) from street view images.

Results suggest that three months post return-to-work policy implementation, walking time for older adults rebounded to 59.34% of its pre-pandemic average level. Recovery was most strongly associated with lower population density. Neighborhoods with higher GVI demonstrated recovery rates 14.4 % higher than those with lower GVI. Enhanced access to bus stations also contributed to recovery, albeit with more modest effects. These insights contribute to the development of walking-friendly communities for older adults while fostering resilience against public health emergencies. By uncovering the built-environment factors that promote mobility recovery in vulnerable populations, our findings support the design of equity-focused urban policies that prioritize inclusive access, adaptive infrastructure, and health-oriented planning in times of crisis and beyond.

Keywords: Mobile phone signaling big data; Causal inference; Convolutional neural network; Mobility equity; Public health crisis

174. Is Existing Enough? Spatial Inequalities in Accessing Public Transportation Services: An Analysis on Ataşehir, Istanbul

Authors: Cansu Çiçek Aydın, Fatih Terzi

Abstract: Rooted in decades of neoliberal urban policies, spatial inequalities have intensified in response to the compounding effects of recent overlapping crises. Today, uneven urban development deepens spatial inequalities, leaving many communities underserved in terms of essential services. In this context, access to public transport emerges as a critical dimension of urban inequality, amidst widening spatial and socioeconomic disparities. This research examines the relationship between socioeconomic development levels and public transportation accessibility across the 17 neighbourhoods of Ataşehir, Istanbul. Using neighbourhood-level demographic, income, education, and mobility indicators, the research constructs two standardised indices: one measuring socioeconomic development, the other capturing access to public transportation. The spatial analysis employs geographic information systems, integrating network analysis, service area modelling, and terrain slope data to assess pedestrian accessibility to mass transportation facilities. Service areas were generated based on a walking speed of 4 km/h, covering up to 1000 metres around transport nodes. These were then compared to socio-economic development levels to detect spatial mismatches. Findings indicate a partial correlation between neighbourhoods' socioeconomic development levels and their access to public transport infrastructure, particularly in the western and eastern parts of Ataşehir. However, in the central and southern neighbourhoods, this relationship breaks down. Here, access to mass transport services appears to be shaped less by present-day socioeconomic profiles and more by path-dependent urban development processes, including historical land use patterns and planning legacies. By integrating spatial data analytics with qualitative interpretation, the research demonstrates that access to urban services is not only a matter of present-day inequality but also shaped by deeper, long-term structural dynamics. The study highlights the urgent need for inclusive infrastructure and transport planning that addresses historical spatial injustices, especially in cities where urban fragmentation continues despite increased investment.

Keywords: Spatial inequalities; Public transport; Network analysis; Istanbul

Session 10 Smart and Inclusive Urban Futures (Online)

21. Toward the Neuro-Comfortable City: Neurodiversity, Public Urban Spaces, and Digital Neuro-Urban Acupuncture

Authors: Charles Josefson

Abstract: Urban environments can be complex and challenging for neurodifferent individuals, who make up 15–20% of the global population and include those with neurotypes such as autism, ADHD, and dyspraxia. While awareness of 'non-visible' conditions is growing within urban professions, many cities still lack systematic approaches to creating truly inclusive public spaces that address both mobility and sensory needs. By considering diverse perceptual and affective dimensions, designers and planners can foster environments that are more accessible, restorative, and regenerative. Urban acupuncture revitalizes cities through rapid, small-scale, and strategically targeted interventions. Digital technology plays a crucial role in this process, enabling data-driven decision-making through citizen science, living labs, data visualization, and social network analysis. These tools help identify key areas of need and critical 'blockages' in urban flows, facilitating more responsive and inclusive urban design and planning. Smart cities, by leveraging digital transition and social innovation, present new opportunities for spatial inclusion. This paper first examines the conceptual foundations and historical evolution of urban acupuncture and its increasing global adoption for urban regeneration. It then explores digital neuroinclusive urban acupuncture as a strategy to enhance the accessibility and usability of public spaces for neurodifferent individuals. Drawing on case studies from my PhD research on neuro-urban geographies in London, the paper demonstrates how targeted digital acupunctural interventions for neuro-comfort can enhance urban wellbeing for both neurodifferent and neurotypical populations, embedding neuroinclusive triple empathy design approaches and contributing to the 'infrastructuring' of a neuro-comfortable urbanism paradigm.

Keywords: Neurodiversity; Inclusion; Urban wellbeing; Digital urban acupuncture; Smart cities

57. Multi-Level Coupling and Coordination Status and Development Trend of the "Smart City Urbanization Low-Carbon City" System

Authors: Yuxin Zhang, Xingchen Lai, Hiroatsu Fukuda

Abstract: The rapid urbanization process has led to the deterioration of urban environments. Smart city construction and low-carbon city development, through their objectives of enhancing urban efficiency and facilitating energy transition, create new potential for improving urban sustainability and carbon emission reduction. To reveal the coordinated relationships within the Smart city - Urbanization - Low-carbon city (SUL) system and achieve multi-level urban sustainability goals, this study constructs a multi-dimensional interactive SUL system framework. Utilizing the entropy method, coupling coordination degree model, and relative development degree index, we analyze the evolutionary trends of SUL system development levels and coupling coordination relationships in Chinese first-tier cities from 2010 to 2022. A detailed examination of the relative development status among subsystems is conducted.The results indicate: (1) During the study period, both the subsystems and the integrated SUL system exhibited a rising trend in comprehensive development levels. Although significant developmental disparities persisted among cities, these gaps demonstrated a gradual narrowing pattern. (2) Most cities demonstrated continuous improvement in SUL system coordination levels, with coordination grades progressively stabilizing. However, persistent intercity developmental disparities necessitate focused attention on coordinated development status in cities such as Changsha and Ningbo.(3)The results of the relative development index indicate that cities should carry out targeted construction based on their own characteristics in order to balance the coordinated development relationship between systems to the maximum extent and promote high-quality and sustainable urban development.

Keywords: Smart-urbanization-low carbon system; Relative development index; Coupling coordination degree

Session 10 Smart and Inclusive Urban Futures (Online)

79. Cities, Crises, and Climate Change: Analysing Delhi as a Polycrisis — Sarnath Banerjee's All Quiet in Vikaspuri Through the Lens of Ecology and Historiography

Authors: Jaya Yadav

Abstract: In my paper, I analyse the (re)creation of the figure of the common man, the 'Aam Aadmi' in a water scarce city, through a close critical analysis of Sarnath Banerjee's All Quiet in Vikaspuri. The (extra)ordinaryness of the everyday, the domestic and the familiar is rendered both unfamiliar and yet oddly close and 'real' to the reader while focusing on the everyday muted violence within. Moreover, the collective memory of a city is chronicled in Banerjee's texts. The dystopian reality of Delhi in All Quiet in Vikaspuri, fueled upon classist binaries between the residents of the city preempts a portrayal of Delhi, which today in terms of climate change, pollution levels and frequent water crises, seems more 'real'. Banerjee literally and figuratively draws upon the margins of the city and the marginalised. He weaves the narrative around climatic concerns and blurs the boundaries between a dystopic ecological narrative within the larger framework of the graphic novel. Another theme to be interrogated is the theme of migration. In the search of both water and livelihood, we see labour migrating across the city and in and out of it. In Sarnath's Corridor, migration too plays a central role in mapping the city. The cartography of the Indian nation state, following the lives of its ordinary citizens, becomes an important site for Banerjee to (re)locate discourses of identity, class, and nationality. The lack of home, in a sense for the marginalised and their longing for it, too shapes the two texts. This study, (re) locates the Indian Graphic Novel as a form of historiography, which simultaneously focalises the urban cityscape, whilst highlighting the nuances in marginalised spaces.

Keywords: Polycrisis; South Asia; Marginality; Migration; Climate change

104. Forging Connections in Integrated Planning: Reflections From a European Experiment

Authors: Dionisia Koutsi, Yannis Paraskevopoulos, Ioannis Chatziioannou, Stefanos Tsigdinos, Sofia Tsadari, Evgeniya Bobkova, Ioanna Stavroulaki, Mariam Shulqami, Nadia Charalampous, Efthimios Bakogiannis, Thanos Vlastos

Abstract: Integrated planning is gaining ground as a holistic approach to addressing spatial, environmental, and societal challenges by blending diverse disciplines, roles, and methodologies. Yet, despite its growing relevance, there remains a lack of a unified platform that connects the different stakeholders involved in this field. To bridge this gap, the InPlaLabs project sets out to create a collaborative network that promotes knowledge sharing, inclusivity, and joint action in integrated planning. Open to individuals and organisations alike, the network embraces a new planning paradigm that combines urbanism, mobility planning, participatory practices, and evidence-based approaches.

This presentation will showcase the foundational structure of the Transnational Network, developed through an extensive scoping review of existing literature and organised around three main pillars: the Charter, the Virtual Knowledge Hub, and the Participatory Guide. The Charter defines the network's structure, principles, and operation; the Virtual Knowledge Hub serves as an online platform for sharing knowledge, data, and resources; while the Participatory Guide offers practical tools for implementing structured participatory processes.

Additionally, this study will introduce a series of hybrid mini-courses designed to enhance both the theoretical understanding and practical skills necessary for effective integrated planning. Developed through co-creation sessions with experts from diverse fields, these courses focus on emerging methods and the use of digital tools in planning, aiming to equip participants with the competencies needed for contemporary practice.

Initial findings confirm the absence of integrated planning culture and highlight the critical need for such initiatives in advancing integrated planning. Nevertheless, achieving genuine integration across sectors and disciplines — engaging academia, policymakers, practitioners, and citizens alike — remains a significant challenge ahead.

Keywords: Integrated planning; Transnational network; International cooperation; Planning labs; Multidisciplinarity

142. Living Experience in the Silicon Alley Model Neighborhood from an Inclusive Perspective: Analyzing Driving Factors of Living Experience in Silicon Alley Using the LDA-DEMATEL Method

Authors: Junqing Zhu, Chenshu Liu

Abstract: The Silicon Alley model is enhancing neighborhood competitiveness from cultural and technological innovation perspectives, while the living experience of community participants also serves as a critical foundation for sustainable development. This study takes Silicon Alley model neighborhoods as its research object and explores a theoretical framework and practical pathways for promoting inclusive public facilities and service design through techno-cultural integration from an inclusive perspective. Based on the LDA topic model, the research identifies seven key factors affecting living experience from multi-source texts, covering social, technological, emotional, and governance dimensions. Using the DEMATEL system analysis method, the causal relationships among these factors are revealed. The results indicate that sustainable collaborative governance is the fundamental driving factor, diversified community experience and urban attractiveness experience serve as intermediate conduct factors, while age-friendly livelihood services, digital facilities, artistic ambiance, and cultural-historical experience act as surface outcome factors. The study proposes short-term focuses on collaborative governance and social integration, with long-term priorities on livelihood services and cultural identity, providing theoretical foundations and practical guidance for enhancing neighborhood living experience and promoting inclusive urban renewal.

Keywords: Silicon Alley model; inclusive design; lived experience; impact interrelationships; LDA-DEMATEL

166. Providing Mechanistic Understanding for Digital Twins: An LSTM-Based Approach to Recognizing Urban Functional Zones in High-Density City

Authors: Heng Zhang

Abstract: Digital twins (DTs) are reshaping the way urban and regional systems are analyzed, managed, and developed. While many existing studies utilize static models that represent urban layouts at a single time slice, this research emphasizes dynamic modeling that reflects urban evolution over time—an approach more consistent with the concept of urban digital twins.

Urban functional zones (UFZs), as foundational components of urban planning and governance, are crucial for improving administrative effectiveness, refining spatial configurations, and strengthening urban adaptability. Proper delineation of these zones not only supports long-term urban sustainability but also enhances crisis response capabilities.

Leveraging continuous, year-round Sentinel-2 satellite imagery and integrating long short-term memory (LSTM) networks to capture seasonal temporal patterns, this study presents a classification framework tailored to high-density urban areas. Traditional zoning methods using fixed spatial units—such as grids or administrative blocks—struggle to represent the intricate patterns of urban functional mixing and segmentation. To address this limitation, this paper introduces a zoning approach based on Urban Block Nodes (UBNs), which combines remote sensing inputs with deep clustering techniques applied to building structures. This hybrid method allows for more granular spatial delineation and functional interpretation.

A case study conducted in Seoul, South Korea, demonstrates the model's effectiveness. Compared to conventional block-based approaches, the UBN-based method offers enhanced flexibility and accuracy in mapping functional urban patterns, highlighting its promising utility in supporting digital twin development and advancing sustainable urban planning.

Keywords: Urban function; LSTM work; High-density city; Urban digital twins (DTs)

20. Nature-Based Solutions for Urban Heat Islands in Megacities: A Case Study of Shenzhen, China

Authors: Ying Zheng

Abstract: This paper explores the environmental challenges caused by rapid urbanisation in Chinese megacities, particularly focusing on the urban heat island (UHI) effect intensified by high-density developments and the growth of urban villages (Chengzhongcun). In megacities like Shenzhen, urban villages have emerged as byproducts of rapid development, leading to overcrowding, inadequate infrastructure, and environmental degradation. While traditional urban regeneration in China often relies on demolition and reconstruction, this approach has resulted in increasingly homogeneous urban fabrics, reducing diversity, adaptability, and sustainability.

In response, the paper investigates nature-based solutions (NBS) as an alternative to conventional redevelopment strategies. It addresses three core problems: the scale and complexity of environmental and social issues in megacities, the overlooked significance of urban villages, and the drawbacks of wholesale demolition strategies. Three research questions guide the study: the advantages of NBS over demolition-based regeneration, the contribution of urban villages to UHI, and how NBS can be designed to improve thermal comfort.

The research employs a three-phase methodology: a transdisciplinary literature review, hybrid environmental simulations and a research-by-design process. The study uses Baishizhou, an urban village in Shenzhen, as a case study to test and apply these methods.

Key findings demonstrate that NBS can effectively mitigate the UHI effect and improve thermal comfort. The research proposes an "urban forest" framework across three spatial scales—building (micro), neighborhood (meso), and district (macro)—to apply NBS in high-density areas. The study offers a comprehensive and scalable strategy for integrating NBS into urban planning.

This paper emphasizes the need to prioritize NBS in urban regeneration to address environmental and social challenges in megacities. It advocates for sustainable, inclusive, and resilient urban development that reconnects humans with nature in the face of climate change.

Keywords: Nature-based solutions; Urban heat islands; Shenzhen; Urban villages; Megacities

64. Towards Polycrisis Resilience: A Social-Ecological-Technical Systems Approach to Urban Resilience Mechanisms

Authors: Yiqing Liu, Kedi Hu, Yiqun Han

Abstract: Urban development is increasingly challenged in a new era of polycrisis shaped by the intertwined evolution of climate change, rapid urbanization, and aging infrastructure. This study focuses on urban stormwater issues to investigate the role of resilience in addressing multiple crises within complex urban systems. Stormwater disasters, historically one of the major hazards for cities, arise not only from direct impacts of climate change, such as extreme weather events, but also from deep-rooted structural problems including irrational spatial planning, ecosystem degradation, increasing social vulnerability, and fragmented governance. Under stormwater scenarios, overloaded infrastructure, ecological imbalances, and limited social response capacities interact and amplify risks, forming typical multi-crisis conditions. Through causal mechanism analysis, this research elucidates the driving factors and interdependencies underlying urban stormwater challenges in polycrisis contexts, revealing cascading reactions among infrastructure, ecological, social, and economic systems. Building on these insights, the study conceptualizes resilience as the core capacity of urban systems to cope with uncertainty and multi-source disturbances, highlighting its pivotal role in promoting adaptive urban transformation. Based on the theory of social-ecological-technical systems (SETs), this research proposes a multi-coupling resilience framework, identifying three key coupling mechanisms: (1) social-ecological coupling, emphasizing the role of social systems in ecological restoration and participatory risk governance; (2) ecological-technical coupling, focusing on the synergy between green infrastructure, nature-based solutions, and engineering systems to enhance adaptive capacities; and (3) social-technical coupling, enhancing urban governance agility through intelligent monitoring, data feedback, and institutional innovation. The study argues that fostering dynamic coordination among these subsystems is crucial for strengthening overall urban resilience and effectively responding to interconnected crises.

Keywords: Polycrisis; Urban resilience; Stormwater resilience

Session 11 Multi-system analysis for climate

87. Heat Stress Adaptation in Urban Slums of Bangladesh: Conditions Shaping Individual and Community Responses

Authors: Zakia Sultana, Heleen L. P. Mees, Bishawjit Mallick

Abstract: Rising temperatures and intensifying heat stress disproportionately affect low-income urban communities, exacerbating existing inequalities and vulnerabilities amid the accelerating climate crisis. Slum residents, facing unplanned housing structures and limited access to essential services like water, electricity and gas, adopt individual and community-driven adaptation strategies to cope with extreme heat. However, the conditions that shape their ability to adapt remain largely underexplored. Employing the Everyone's Adaptation framework, this study examines the key conditions that shape individual and community-level responses to heat stress, and how these are experienced across intersections of gender, age, and socio-economic status. Data were collected through a qualitative mixed-methods approach, employing focus group discussions, in-depth interviews, expert interviews, and field observations conducted between June and August 2024 in Korail slum, Dhaka, Bangladesh. Findings indicate that individual resources, such as income are pivotal to individual adaptation, while social capital critically supports community resilience through mechanisms of resource sharing and enhanced access to basic services. However, persistent inequalities in resource distribution exacerbate individual vulnerabilities, intensifying the local impacts of global climate change. Participants emphasize the need for long-term adaptation strategies, such as improved housing conditions, rather than reliance on temporary interventions like cooling centers. Furthermore, the findings highlight the necessity of age-sensitive and gender-specific adaptation measures, as women particularly face heightened challenges due to the dual responsibilities of household management and external paid work. By systematically analyzing eight conditions across individual, community, and collective levels, this paper advances understanding of everyday adaptation practice to heat stress in informal urban contexts. The study contributes to the development of more equitable, context-sensitive heat stress adaptation policies and provides critical insights into building urban resilience and promoting climate justice in response to the interconnected challenges of the contemporary polycrisis.

Keywords: Heat stress adaptation; Everyone's adaptation conditions; Urban slums; Climate change vulnerability; Inequalities

106. Re-Imaging Beijing's Urban Wetland Through 1110 Years of Transformation

Authors: Zhuhui Bai

Abstract: Urban wetlands provide critical ecosystem services but face increasing pressure from urbanization and climate change. Effective management is hindered by limited understanding of their long-term transformation dynamics. Addressing this, we present a novel, 1,110-year reconstruction (A.D. 916–present) of wetland evolution in Beijing, integrating landscape history methods with archival and geospatial data. Our analysis reveals profound transformations across five distinct epochs, demonstrating shifts from imperial gardens to vital sites for food production and water regulation, culminating in contemporary Urban Wetland Parks (UWPs). These landscape reconfigurations were driven by complex interactions between demographic shifts, policy changes, and evolving societal values regarding natural resources. Crucially, despite radical structural changes, these wetlands exhibited remarkable functional persistence, continuously delivering core ecological (e.g., flood mitigation, habitat), social (e.g., recreation), and economic functions. This deep historical perspective illuminates the mechanisms underpinning urban wetland resilience and vulnerability. It provides essential, historically-grounded insights for developing effective restoration initiatives, adaptive management strategies, and designing future urban wetland park capable of sustaining critical landscape functions amidst ongoing environmental change.

Keywords: Urban wetland park; Land transformation; Driver; Landscape function

Session 11 Multi-system analysis for climate

151. Resilience in the Face of Polycrisis: Multi-Source Integration Analysis and Dynamic Adaptation Pathways of Cultural Route Node Cities in Europe

Authors: Kedi Hu, Yiqing Liu, Yiqun Han

Abstract: Amid the intertwining crises of climate change, economic instability, geopolitical tensions, and public health, urban systems face unprecedented vulnerability challenges. As a transnational cultural network, European cultural routes connect hundreds of cities, forming a cross-scale, multi-dimensional cooperation framework with potential resilience-supporting capabilities. This study views European cultural routes as resilience collaboration networks within urban systems, focusing on their adaptive responses and resilience evolution in the context of multiple crises. Using multi-source urban data analysis, including dynamic monitoring data, socio-economic indicators, and climate impact records, combined with spatial mapping and predictive modeling methods, we identify resilience factors and assess cities' vulnerability and adaptability. Representative routes such as the Camino de Santiago and the Hanseatic League are selected to study the adaptive behavior patterns and dynamic structural adjustments of cultural route node cities. Preliminary analysis shows that cultural route node cities exhibit strong resilience in social participation, employment growth, and inter-regional cooperation. Differentiated resilience trajectories emerge due to differences in economic diversity, policy flexibility, cultural diversity, ecological richness, and social structure. This research will further enhance data collection to reveal how node cities within cultural routes develop local collaboration, data governance, and institutional embedding as resilience response patterns, thus enhancing urban recovery and adaptability amidst multiple crises.

Keywords: Polycrisis; Urban resilience; Cultural routes; Adaptation pathways; Multi-source data

175. Urban Vulnerability Assessment in China's Coastal Zones: A Water-Heat-Biodiversity Nexus Perspective

Authors: Chengwei Li, Xiangrong Wang, ChengHe Guan

Abstract: Against the backdrop of global environmental change, cities face unprecedentedly complex ecological and socio-political challenges, with climate change significantly exacerbating the uncertainty of these threats. On one hand, climate change severely disrupts ecosystem diversity, stability, and equilibrium, undermining the overall health of global ecological systems. On the other hand, its cascading effects increasingly permeate socio-economic systems, threatening human living environments, hindering social advancement, and influencing political and cultural development. To address global change's ecological and socio-economic challenges, vulnerability research has emerged as a pivotal theoretical framework for examining the positive and negative feedback mechanisms within coupled human–environment systems. It integrates multidisciplinary theoretical knowledge and has become one of the core components of sustainability science, particularly in bridging scientific research and policy-making. Moreover, coastal regions, home to a large proportion of the world's population and centers of intensive economic activity, are experiencing mounting vulnerability due to climate-induced pressures and the degradation of coastal biodiversity. This study systematically reviews multi-dimensional urban vulnerability under regional environmental perturbations. It proposes a theoretical assessment model at the landscape scale, focusing on the nexus of water, thermal conditions, and biodiversity. Applying the WHE nexus-based vulnerability methods to coastal cities in China, the study conducts an empirical assessment to explore spatial heterogeneity and scenario-based resilience planning. Specifically, we aim to reveal the interlinkages among water, heat, and biodiversity exposure in coastal urban systems, assess the spatial-temporal heterogeneity and intensity of urban vulnerability shaped by varying levels of urbanization, and explore adaptive strategies for coastal areas in the face of future sea level rise scenarios under climate change.

Keywords: Urban compund vulnerability

Session 12 Addressing Urban Issues with Urban Data

75. Children in Urban Violent Conflicts: Subnational Population Mapping in 99 Countries Across the Globe

Authors: Aubrey Steingraber, Natalia Tejedor-Garavito

Abstract: Recently, there have been efforts to map the impact of violent conflict on children, enabling researchers to trace trends through time and across space. However, there has been little research intersecting children in conflict settings and settlement typologies. This is an important oversight as the delivery of humanitarian aid and public health programmes aimed toward children differs between rural and urban settings. This paper presents the results of geospatial analysis to maps (at 1km resolution) children in conflict settings in 75 countries across the globe and explores the types of settlements in which these children live. It achieves this by combining age/sex disaggregated populations estimates produced as part of WorldPop's Global 2 project (2025), conflict locations from ACLED, and GHSL's GHS-SMOD that maps the degree of urbanisation of each 1km square of the globe. Adapting a methodology from the Conflict Exposure Calculator (WorldPop/ACLED), maps of conflict areas between 2018 and 2023 as a series of three buffer zones representing minimum and maximum areas impacted by violent conflict events are produced. The population of children impacted by conflict living within urban, peri-urban, and rural areas are summarised by subnational administrative units, enabling global comparisons through time. This paper presents the general trends in the proportion and population of children impacted by urban and peri-urban conflict. It compares these results by global region and then highlights subnational patterns in one country in South America, Asia, and Africa, comparing the types and intensity of conflicts impacting children in each country.

Keywords: Urban conflict; Children; Age/sex disaggregation; Population modelling

82. Mismatch of Social Inclusion and Street Space Quality: Characteristics, Mechanisms, and Implications

Authors: Yujin Huang, Guodong Fang, Jinming Yan, Liang Dong

Abstract: Achieving high social inclusion and high-quality built environments constitutes the dual objectives of constructing sustainable cities. The present study explores the disparity between Street Space Quality (SQ) and Social Inclusion (SI) in Beijing, examining their spatial distributions and underlying driving factors. Data from 14,901 1-km grids were utilized to measure SI across six dimensions: gender, age, education, income, consumption, and occupation, using the Shannon diversity index and entropy weight method. Approximately 250,000 sampling points were assessed for SQ using nearly one million street view images. The results indicate significant spatial variations between SI and SQ, where SI exhibits a "core-periphery" distribution pattern, whereas SQ demonstrates high heterogeneity and poor correlation with SI. Mismatch analysis shows that regions with SI exceeding SQ are primarily located in central districts, whereas those with SI lower than SQ are predominantly found in peripheral areas. Linear regression analysis identifies key factors driving mismatch, namely shopping facility density, road network density, land use mix, and PM2.5 concentration, which enhance the probability of mismatch transitions. Conversely, factors such as the nighttime light index, company density, housing prices, medical facility density, proximity to the nearest subway station, sports and leisure facility density, road hierarchy, and NDVI decrease the likelihood. The nonlinear analysis reveals significant threshold effects and distinct ranges of statistical significance for various variables, emphasizing the complexity of urban systems. These findings support actionable policy interventions and propose a mismatch-based framework to guide urban governance strategies, aiming to minimize excessive mismatches and foster more inclusive and sustainable urban development.

Keywords: Social inclusion; Street space quality; Street view image; Mismatch characteristic; Urban justice

Session 12 Addressing Urban Issues with Urban Data

118. Quantifying Housing Market Stress From Short-Term Rentals: Composite and Bayesian Indicators for Cornwall

Authors: Francesco Viviani, Zahratu Shabrina

Abstract: The rise of Airbnb has turned short-term letting into a mass phenomenon, transforming not only tourism revenues but also the liveability of the neighbourhood. Although these effects have been extensively documented in metropolitan centres in the UK, such as London or Manchester, few empirical studies have examined their consequences in other tourist regions where the housing stock is comparatively thin and local economy depends on seasonal tourism. Cornwall, which is characterised by a sharp summer flow of visitors and structurally limited long-term housing, illustrates this tension as holiday demand and local need for housing affordabilities collide throughout the year.

This article proposes a set of market-stress indicators that explores the tensions resulted from short-term rentals at the MSOA level in Cornwall. We begin by deriving three standardised metrics: a Gini index that captures the concentration of Airbnb listings in the hands of a few multi-host operators; a Shannon diversity index that measures the heterogeneity of host types; and the Airbnb-to-dwelling ratio that proxies the outright substitution of residential stock by short-term lets. The three z-scores are summed to form a composite Stress-Market Index. The robustness of the index is verified by estimating an equivalent latent factor through a Bayesian latent factor model.

Findings show that the indicators rank each MSOA along a continuum of housing stress, pinpointing some concentration of high-risk coastal areas while also highlighting a broader belt of medium-pressure districts inland and to the south of the region.

By converting short-term rental statistics into market stress scores, our framework offers a tool for planners and policymakers who seek to balance seasonal overtourism with the right to adequate and affordable housing for locals - an issue that, to date, has received less quantitative attention in South-West England.

Keywords: Short-term-rentals; Composite indicators; Urban planning

148. The Associations Between Neighbourhood Type, Neighbourhood Built Environment, and Overweight: Evidence From China

Authors: Mingjie Sheng, Wen Jiang

Abstract: Overweight is a global health concern. Existing western studies reveal disproportionate concentrations of overweight in certain types of urban neighborhoods, namely low socioeconomic and ethnic minority neighborhoods, and suburban sprawling neighborhoods. However, China's contexts are much different. There is a widely accepted dichotomous classification of neighborhoods (the old community built prior to 2000, and the new commodity housing estates built after 2000), which acts as an important proxy for socioeconomic stratification and built environment disparities in contemporary urban China. This paper therefore examines how neighborhood type, the widely-accepted neighborhood "obesogenic" built environment factors (neighborhood food environment, neighborhood walkability, and neighborhood green space), and overweight are associated with each other in Chinese cities. Data for this study came from "the Population and Family Health Survey in Hebei Province", which comprise of 1542 adult residents in 42 urban neighborhoods in Hebei province. The findings show that unhealthy food environment, the presence of green space, and land use mix are significantly positively related to overweight among all respondents. Neighborhood type and the above-mentioned built environment factors are related, but rather complicated. Compared with commodity housing estates, old communities witness more unhealthy food retailers nearby, which might increase the risk of overweight. But meanwhile, old communities also have less green space and report lower levels of land use mix nearby, which might have "protecting effect" on overweight. Varying residents' sociodemographic characteristics between the two types of neighbourhoods may also exert influence: residents from old communities are generally older, and are less likely to live a healthier life, which can increase the likelihood of overweight. The overall impact of neighbourhood type on overweight depends on the trade-off between those effects. In the current study, no significant difference in overweight is observed between old communities and commodity housing estates.

Keywords: Neighborhood type; Overweight; Neighborhood food environment; Neighborhood walkability; Neighborhood green space

Session 12 Addressing Urban Issues with Urban Data

164. Impact of Courtyard Wind Environment Types on Indoor Ventilation Performance: A Case Study of Traditional Vernacular Residences in Coastal China

Authors: Yiying zhu, Weijun Gao, Dewancker Bart, Kaixuan Chen

Abstract: Although previous studies have established the correlation between courtyard layouts and outdoor wind environments, the mechanisms by which different courtyard types influence indoor ventilation have not been fully explored. This study investigates how five courtyard types—front courtyards, rear courtyards, domain-type courtyards, continuous courtyards, and layouts without courtyards—affect indoor airflow distribution in traditional coastal residences. By integrating field measurements (using a Testo 400 anemometer) with computational fluid dynamics (CFD) simulations, we developed a wind pressure-driven airflow model extending from the courtyard to the indoor spaces, incorporating variations in courtyard layouts and opening configurations. The results reveal a clear interdependency: direct-entry front courtyard layouts significantly enhance indoor ventilation, exhibiting optimal air change rates and wind environment comfort. In contrast, turning-entry and side courtyard layouts, due to their complex airflow paths, lead to a notable decrease in ventilation efficiency and the formation of stagnant air zones. Rear courtyard layouts demonstrate relatively good ventilation performance under specific conditions; however, the addition of wind barriers or other obstructions at the entrance can substantially weaken air exchange effectiveness. This study advances passive design strategies for traditional coastal dwellings and offers practical insights for low-intervention retrofits in culturally sensitive environments.

Keywords: Courtyard types; Indoor ventilation; Thermal comfort; Computational fluid dynamics (CFD)

172. Multi-Agent Proximal Policy Optimization for Labour Market Dynamics

Authors: Lina Waqfi, Bilal Farooq, Zachary Patterson

Abstract: Understanding the evolving dynamics of labour markets requires models that capture the adaptive behaviors of both workers and employers under uncertainty. This research presents a novel simulation framework that conceptualizes the labour market as a decentralized, partially observable multi-agent system, where heterogeneous agents—workers and firms—make sequential decisions in pursuit of individual goals such as job acquisition, skill investment, and hiring optimization.

The framework is implemented using Multi-Agent Proximal Policy Optimization (MAPPO) integrated with a Dual-Transformer (DT) neural architecture. This DT-MAPPO approach leverages two complementary components: a Spatial Transformer that captures inter-agent interactions at each time step (e.g., competition among workers, job-matching dynamics), and a Temporal Transformer that models sequential patterns over time, such as skill development, employment transitions, and fluctuating hiring needs. This dual attention mechanism allows agents to learn sophisticated strategies that adapt to evolving labour market conditions and policy environments.

Through controlled simulations, the model demonstrates how complex labour dynamics emerge from decentralized decision-making processes. Worker agents learn to maximize long-term utility through strategic job applications and reskilling, while firm agents adapt their hiring and retention strategies to shifting labour supply and productivity goals. The framework also enables experimentation with policy scenarios—such as training incentives or wage subsidies—and their impact on employment outcomes and market efficiency.

By combining the interpretability of agent-based modeling with the scalability and expressiveness of deep reinforcement learning, this study contributes a flexible and high-fidelity tool for labour market analysis. It provides methodological innovations in integrating transformer-based attention mechanisms with multi-agent learning and offers actionable insights for researchers and policymakers aiming to better understand labour market behavior and optimize interventions in uncertain, dynamic settings.

Initial results, along with detailed analyses, are anticipated to be available by September 2025.

Keywords: Labour market; Multi agent reinforcement learning; Microsimulation

15. Predicting Urban Vitality and Pedestrian Road Safety in Urban Areas Based on Machine Learning

Authors: Weijie Qiao, Hao Zheng

Abstract: Urban vitality and pedestrian road safety are two critical indicators of the quality of urban life, both of which are heavily influenced by spatial factors in the urban environment. However, traditional quantitative models rarely address the relationship between these issues simultaneously and often lack the capability to provide real-time, interactive feedback for urban planners. This research aims to utilize Generative Adversarial Networks (GANs) to develop a predictive model of generating city maps and heatmaps that represent urban vitality and pedestrian road safety. Using San Francisco as a case study, we integrate pedestrian crash data, census population data, and other built environment data to train the predictive model with a dataset containing over a thousand pairs of images. After model training, the best-performing models are selected in the experiments of various urban scenarios simulation, assessing the prediction accuracy of urban vitality and pedestrian road safety. The results indicate that this approach has a high prediction accuracy of urban vitality and pedestrian road safety, especially allowing for effective evaluation of the changes in the impact of pre- and post-design modification for practical applications. Additionally, the research introduces a novel methodology that offers a framework for future studies, showing its potential to be generalized and predict the issues in complex urban contexts.

Keywords: Urban vitality; Pedestrian road safety; Urban design; Generative adversarial networks

43. Form, Function, and Equity in the Urban Carbon Cycle: A Comparative Study of Local Climate Zones, Net Primary Production, and Socioeconomic Impacts in Cook County, IL, and Singapore

Authors: Jiajia Wang, Yixin Wu

Abstract: Cities worldwide confront increasing challenges of climate change and biodiversity loss, yet urban morphology, which fundamentally shapes ecosystem processes, remains insufficiently integrated into climate mitigation planning (Churkina et al., 2020). This study examines the interaction between urban morphology and ecosystem productivity of Cook County, Illinois, and Singapore. It provides insights into how urban planning and morphology can strategically enhance ecosystem services and the connections with socio-economic factors, which is crucial for urban resilience and sustainability (Bai et al., 2018).

The Carnegie-Ames-Stanford Approach (CASA) model integrates remote sensing data and local measurements of vegetation indices, solar radiation, temperature, precipitation, and soil water content data to calculate Net Primary Production (NPP) across varying landscapes (Potter et al., 1993). Local Climate Zone (LCZ) classifications were mapped and analyzed against NPP to identify spatial patterns and correlations within diverse urban forms. ANOVA analysis evaluated relationships between urban morphology and carbon sequestration potential, while Pearson correlation analyses explored correlation with urban socio-ecological dynamics.

CASA modeling reveals annual carbon sequestration of 0.42 Mt CO2-equivalent in Cook County (55% from open low-rise areas) and 0.87 Mt CO2-equivalent in Singapore (35% from dense trees). Dense trees, scattered trees, and sparsely built LCZs yield the highest NPP across both regions. LCZ classification explains 49% of NPP variance in Cook County and 57% in Singapore. Socioeconomically, NPP correlates negatively with renter rates but positively with married households and median income in Cook County. Singapore shows lower NPP in areas with higher dwelling density and owner-occupation rate, while regions with residents with higher education rates demonstrate increased NPP.

This study provides insights for evidence-based planning strategies addressing climate and social challenges by identifying morphologies that optimize ecosystem productivity. These findings can inform policies and design practices to create more resilient, equitable, and ecologically productive cities amid intensifying climate impacts.

Keywords: Local climate zones; Carbon sequestration; Net primary production; Urban morphology; Socio-economic data analysis

Session 13 Methods and Models in Urban Transport Research

94. Understanding Mobility Modes: The Effect of Quantitative Evaluation "Urban Intervention" on Urban Performance — Urban Interaction Simulation Platform Application on Environment Behavior Testing in Public Spaces

Authors: Chen Cui

Abstract: Urban Morphology reflects the Social Patterns. Future urban will not only supply the basic living needs such as clothing, food, shelter and transportation, but also perform real-time calculations and adjustments according to different user groups, and use technology to achieve more efficient, flexible, environmentally-friendly resource allocation, space optimization, and citizen services.

Urban Interaction Simulation Platform introduces different types of experimental urban intervention factors in the process of urban planning, and uses mobile communication data and monitoring probes to synchronize the spatial communication patterns of different people in public spaces to simulate different "urban interventions" in real time. The influence of factors on the city performance, and then obtain experimental data for the environmental behavior response of different people in public spaces.

The real-time quantitative evaluation of the full sample of spatial big data is of revolutionary significance to promote the development of urban planning toward the direction of refinement, accuracy, and scientific. Mobility solution vary in their impact on the urban landscape.Integrate urban performance metrics(City Science radar plot)with an agent-based model focused on new mobility modes to map people's profiles(behavioral profiles)to mode choice with a focus on healthy community options.

In addition, the Environment Behavior testing in Public spaces on the Urban Interaction Simulation Platform for special groups that were often neglected in the past, such as the disabled, the elderly, and children, enables us to conduct comprehensive design or Obstacle design, considering the special requirements of their usage habits and their psychological demands, fully reflects humane care and enhances urban performance.

Keywords: Quantitative evaluation; Urban interaction simulation; Environment behavior; Urban performance; Mobility modes

109. Exploring a Mixed-Experts GeoAI Framework for Implementing Land Value Capture in TOD: A Case Study of Muscat

Authors: Humaid Alrashdi, Guoqiang Shen

Abstract: This study investigates the implementation of Land Value Capture (LVC) mechanisms within Transit-Oriented Development (TOD) strategies using a Mixed-Experts GeoAI framework, focusing on the rapidly urbanizing city of Muscat. The proposed approach merges human-centric expertise with artificial intelligence to analyze complex geospatial phenomena such as urban fragmentation and spatial inequality. By employing deep learning models alongside expert-driven interpretation, the framework supports the development of more resilient and context-sensitive urban strategies. A key strength of mixed expert GeoAI systems lies in their ability to integrate the intuitive, situational awareness of human planners with the urban analytical power of AI to process large-scale datasets, identify latent patterns, and predict urban and environmental trends. This is particularly relevant in Muscat, where the proposed TOD spans a 55-kilometer Light Rail Transit (LRT) corridor—demanding scalable, adaptive planning tools that can accommodate the city's diverse geographies and development pressures. The synergy between AI and human judgment is especially valuable in dynamic and high-stakes environments, enhancing decision-making processes not only in urban development but also in emergency response planning. Ultimately, this research underscores the potential of Mixed-Experts GeoAI to advance equitable value capture strategies and adaptive urban planning practices in cities facing rapid transformation.

Keywords: Urban fragmentation; Mixed-expert GeoAI; Land value capture (IVC); Transit-oriented development (TOD)

115. AI-Powered Assessment of Streetscape Quality Related to Pedestrian Crashes

Authors: Huan Zhou, Qingbin Cui

Abstract: Urban streetscape quality is critical to pedestrian safety, yet large-scale, up-to-date assessments of streetscape quality remain a major challenge. Traditional methods (e.g., field audits and visual surveys) are labor-intensive and difficult to maintain at scale. This study proposes an AI-powered approach to assess streetscape quality efficiently and accurately. Seven indicators associated with pedestrian crash risk are used for evaluation: road surface condition, sidewalk presence, sidewalk condition, presence of sidewalk buffer zones, crosswalk visibility, traffic sign presence, and streetlight availability. The methodology includes collecting Google Street View images, manually labeling a subset, generating pseudo-labels using AI, and training a convolutional neural network (CNN) using Vertex AI to perform multi-label classification. The model is validated using data from Baltimore City as a case study. Results demonstrate that the model achieves over 80% precision and reveal a strong association between poor streetscape quality and a high number of pedestrian crashes. This study highlights the potential of automated, AI-driven tools to conduct large-scale streetscape quality assessments, offering planners valuable insights to identify high-risk street conditions and prioritize safety interventions effectively.

Keywords: AI; Streetscape quality; Pedestrian crash

167. Constructing an Agent-Based Model of Retail Centres: Exploring Retail Competition and Consumer Behaviour

Authors: Akos Balog, Gabriele Filomena, Ron Mahabir, Les Dolega

Abstract: This study develops an agent-based model to retail centre networks in the Liverpool City Region, focusing on consumer behaviour, retail competition, and spatial dynamics as well as evaluating the novel application of agent-based modelling to retail throughout. Agent-based modelling is applied to simulate how individual consumers make decisions about shopping locations based on proximity, accessibility, and retail attractiveness, resulting in emergent patterns of retail centre usage across the region. By leveraging comprehensive datasets, the model integrates detailed consumer demographics, transportation choice, and retail centre characteristics. The results highlight critical dynamics in the retail network, revealing that while small, local centres cater to routine, convenience-based needs, larger regional and town centres maintain dominance as shopping destinations, drawing consumers from broader areas. Furthermore, the model captures accessibility disparities, with urban centres benefiting from shorter travel distances while peripheral areas face increased challenges. Scenario testing demonstrates that a decline in traditional town centres leads to increased demand in retail parks, indicating that shifts in consumer preferences can significantly alter the retail landscape. These findings provide valuable insights for urban planners and policymakers, helping them develop strategies to improve accessibility, manage retail competition, and ensure equitable service distribution across the LCR. The study concludes by discussing the potential of ABM as a robust tool for testing urban retail planning scenarios and fostering sustainable urban development.

Keywords: Abm; Retail centres; Consumer behaviour; Transportation

Session 14 Social and Spatial Inequality

17. Access to Green Electricity in Africa's Rural Areas

Authors: Junior Mbangala, Mapapa Augustin Mbangala

Abstract: The African continent suffers from limited access to electricity, particularly in rural areas, where the lack of infrastructure and investment poses major challenges (World Bank, 2023). Regarding the socio-economic development of African nations, Karbassi et al., (2023) demonstrate that the widespread use of electrical energy is now essential. Installed capacity in sub-Saharan Africa is 68.25 GW, while a single country like France had 144.3 GW of capacity in 2022 (IRENA, 2022). Enabling widespread use of electricity is correlated with improvements in public services in several important areas, such as education, health, the economy and social well-being. The industrialization of African countries is associated with their ability to produce and consume large quantities of energy (Aori Mabea, 2020).

Since fossil fuels are the main sources of energy used in Africa (Mentel, 2022), it is necessary, from a sustainable development perspective, to move away from the massive use of fossil fuels and transition towards sustainable energies linked to the potential energy present in Africa. In African's rural areas, access to electricity varies from one African country to another but generally remains very low (IRENA, 2021, p. 23). The lack of access to electricity is correlated with two main phenomena: lack of financing and investment in untapped energy sources, and infrastructures that have not been modernized and are de facto obsolete (Estache et al., 2007).

The issue we are addressing in this study is the distribution of electricity between urban and rural areas in Africa. Renewable energy is needed for these regions to grow by launching various activities that require energy (Brini, 2021) and the problem of profitability arises, because if renewable energy produced covers rural areas, this energy must be used (Mentel et al., 2022).

Keywords: Renewable energy; Green electricity; Africa; Inequality; Urban development

39. Mobile Internet Connectivity and Household Wealth in the Philippines

Authors: Zhiwu Wei, Neil Lee, Yohan Iddawela

Abstract: The rapid spread of mobile internet has had profound economic consequences. In this paper, we consider the impact of mobile internet on household wealth in the Philippines. We use a novel identification strategy based on both the staggered rollout of 0.27 million geocoded cell towers and an instrumental variable approach based on distance to submarine cable landing points across the Philippines islands. We find that mobile internet access increased household wealth, an effect which persists across education groups and is more pronounced in urban areas compared to rural ones. Combining individual survey datasets with POI data, we investigate mechanisms and show that mobile internet connectivity stimulates activities in several key economic sectors. Furthermore, we find that mobile internet access enhances male employment opportunities, though this positive effect does not extend to female employment. Based on these results and the literature, we suggest policymakers should (i) improve cell tower coverage, particularly in areas further from landing points, and (ii) accompany efforts to improve internet coverage with digital literacy programmes and efforts to encourage access to technology.

Keywords: Internet access; Inequality; Philippines

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46. The Relationship Between Participation Frequency Among the Elderly and Accessibility of Mutual-Aid Elderly Care Facilities: Evidence From Peri-Urban Villages in Shanghai

Authors: Xin Ma, Tetsuya Yaguchi

Abstract: Social participation is one of the key factors influencing the health of the elderly, and participation frequency is considered an important health indicator. China's urban-rural dual system leads to uneven distribution of elderly care resources across urban and rural areas. In recent years, the government has promoted mutual-aid elderly care (MAEC) facilities in peri-urban areas to provide services and venues for activities, encouraging the elderly to participate. Compared with remote rural areas, although peri-urban areas are closely connected to cities, they still face the problem of insufficient accessibility of elderly care services. While existing studies have primarily focused on service provision, quantitative analyses of the relationship between participation frequency and accessibility among the elderly in peri-urban contexts remain limited.

This study examines how accessibility factors influence the frequency of participation in MAEC facility activities among the elderly, thereby providing empirical evidence for optimizing the elderly care service system. A questionnaire was conducted among older residents over 60 in three revitalization demonstration villages in Fengxian District, Shanghai. The relationships between transport mode, travel time, and participation frequency were analyzed using chi-squared tests and ordinal logistic regression.

The results show significant correlations between transport modes and participation frequency ($p = 0.016$), as well as between travel time and participation frequency ($p = 0.012$). However, only the travel time is an influencing factor in the frequency of participation ($p < 0.05$), especially short-distance travel within 10 minutes, significantly increased participation levels. The study calls on policymakers to focus on the spatial distribution and transportation support of elderly care facilities in peri-urban areas, to promote a fairer and more efficient elderly care service system.

Keywords: Population aging; Participation frequency; Accessibility; Peri-urban villages; Social equity

53. Rural Public Transport Disparities in Major Chinese Cities: A Barrier to SDG Achievement

Authors: Bingzhi Liu, Zihua Chen, Zhenbo Wang

Abstract: Public transport accessibility is essential for achieving SDG 11, aimed at sustainable cities and communities. While SDG report in 2023 highlights that over 80% of the population in major cities had convenient access by 2020, these figures may obscure significant neglect in urban fringes and low-income areas, exacerbating transport inequities. Here, we show that only two out of ten major Chinese cities met the SDG's benchmark for rural accessibility in 2023, with the lowest reaching only 34%. In our study, the addition of new bus stations from 2017 to 2023 appeared to have minimal or, in some cities, even negative impacts on improving accessibility. Furthermore, our analysis from urban planning, demographic, and geographic perspectives identifies key drivers of urban-rural transport disparities and advocates for strategies that prioritize equity and resource distribution for peripheral residents.

Keywords: Public transport accessibility; SDGs; Urban-rural disparities; Spatial analysis; Transportation equity

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114. Rethinking the Escalator Effect: Birthplace and Parental Employment in Chinese Migration

Authors: Lingyan Li

Abstract: Existing research on migration and social mobility has predominantly emphasized the "escalator effect" of destination regions, overlooking how origin-region characteristics and family backgrounds shape migration dynamics. This study addresses this gap by examining how birthplace type interacts with parental state-sector employment to influence migration propensities and intergenerational mobility in China.

Using a pooled cross-sectional dataset from the China General Social Survey (CGSS), this research employs a sample of approximately 12,000 individuals after data cleaning and selection. Multivariate regression models will be used to analyze: 1) heterogeneous migration propensities across birthplace-family background groups, 2) disparities in intergenerational mobility.

This study hypothesizes that state-sector families—especially those with high-ranking parental positions—exhibit higher migration propensities due to institutional resources and social capital. Their children are more likely to achieve upward intergenerational mobility via migration. Low-ranking state-sector families, relying on basic workplace benefits, tend to migrate to proximate cities, with intergenerational status maintenance as a key feature. Among non-state-sector families, high-income groups, leveraging economic capital, show comparable migration propensities to state-sector families, favoring agglomeration in first-tier cities. Other non-state-sector families, constrained by limited resources, engage in survival-driven migration with smaller-scale mobility and limited intergenerational status elevation. These differential effects may be moderated by the economic level of birthplaces; for example, state-sector advantages are more pronounced in less developed regions, while high-income non-state-sector families are more active in developed areas.

By integrating birthplace and family background, this research aims to enrich the "escalator effect" theory by demonstrating that migration outcomes depend not only on destination opportunities but also on origin-based endowments. The findings, once finalized, will advance understanding of how institutional and spatial endowments shape intergenerational mobility trajectories, providing empirical support for policies that address migration inequalities.

Keywords: Escalator effect; Migration; Social mobility; Family background; Birthplace

131. Constructing Index for the Assessment of Urban Residential Land Efficiency Using Location-Based Big Data

Authors: Yuan Yuan, Han Mu

Abstract: Information technology empowerment is currently a hot topic in China's territorial space planning. However, the research on territorial space utilization evaluation through the integration of big data is still in the exploratory stage. This study comprehensively utilizes multi-source geographic spatial data, taking urban residential areas as the evaluation units to construct residential land use efficiency indicators, revealing the differences in land use efficiency among different residential areas in the new urban area of Changzhou City. The results show that: (1) The population size within the residential area at the hourly granularity shows a periodic fluctuation, with the peak generally occurring at 21:00, which conforms to the daily routine of urban residents going out during the day and returning at night. Moreover, the population aggregation degree and scale values of residential buildings with different floor area ratios also vary. (2) The 29 residential areas are divided into five groups based on their construction years: 1980s, 1990s, 2000s, 2010-2015, and 2015-2018. The average values of the efficiency indicators among these groups differ significantly, and there is a clear downward trend with 2010 as the dividing line. (3) The efficiency indicators are not directly linked to the level of intensive land use. The development cycle of new urban areas and new districts, as well as residents' demands for the quality of the living environment, all have an impact on land use efficiency. Location big data, as a high-precision source of population data, can objectively reflect the temporal and spatial characteristics of population aggregation in residential areas. The residential land use efficiency index constructed based on this can provide a new approach for territorial space utilization analysis.

Keywords: Residential land use efficiency; Location-based big data; Territorial spatial planning; Spatial-temporal characteristics

Session 15 Urban Resilience (Online)

33. Compounding Effects and Recovery Challenges From Sequential Floods in the Southern U.S.

Authors: Yang Yang, Haoying Han, Chao Fan

Abstract: In flood-prone regions of the Southern U.S., the recurrence of flood events disrupts recovery cycles, gradually eroding economic stability and community resilience. Traditional disaster response frameworks often treat floods as isolated incidents, overlooking the compounding nature of sequential events. This study investigates how flood recurrence intervals and recovery trajectories interact to shape long-term economic outcomes, analyzing 2.6 million NFIP claims and 15 million property transactions. Findings reveal that economic losses intensify non-linearly after multiple consecutive floods, as subsequent events build upon prior damages, compounding their financial impact. Additionally, the intervals between floods play a crucial role, with longer intervals between events resulting in greater total losses compared to shorter intervals, particularly when floods are spaced further apart over a prolonged period. Property values also decline progressively, with depreciation accelerating when floods occur multiple times within a year and further compounding as flood sequences extend over time.

These findings highlight the need for a paradigm shift in disaster risk management, integrating temporal compounding effects into resilience planning. As flood sequences intensify, recovery trajectories become increasingly difficult, gradually eroding the resilience of infrastructure, communities, and local economies. Repeated exposure to floods reinforces long-term vulnerabilities, creating a self-reinforcing cycle where economic and structural fragility deepens over time. Addressing these dynamics requires a proactive risk management framework that recognizes cascading vulnerabilities, prioritizes early intervention to mitigate escalating damages, and integrates long-term resilience strategies into disaster planning.

Keywords: Climate change adaptation; Flood sequences; Community resilience

65. Drivers and Mechanisms of Border Development: Insights from Border Regions

Authors: Yuchen Zhang, Bart Dewancker, Zhengli Mao

Abstract: This article examines the formation and evolution of borders and border cities, showing that borders have shifted from military defense lines to multidimensional spaces integrating national identity, culture, economy, and technology. Based on qualitative analysis and multiple case studies, it identifies trade, transportation, defense, and cultural integration as key drivers of border city development, while noting that their urbanization rates historically lag behind national averages. Under the joint influence of national policies and global forces, border cities follow integrated trajectories of population growth, functional upgrading, and spatial restructuring, accompanied by changes in transport networks, architecture, and economic linkages. The study argues that urbanization is not only an outcome of border development but also a mechanism reshaping border types, offering insights for inclusive and eco-friendly border governance. It concludes that sustainable border city development requires context-specific models that integrate multiple drivers and local frontier characteristics to define appropriate pathways for future growth.

Keywords: Border port cities; Spatial expansion; Eco-environmental crisis; Data simulation; Cross-border regional collaboration

Session 15 Urban Resilience (Online)

78. Imperfect but Adaptive: Spatial Analysis for Urban Risk Identification Under Data Constraints

Authors: Wanbo Liu

Abstract: Urban sustainability increasingly relies on data-driven planning. However, data scarcity remains a major constraint, particularly in developing regions and sensitive areas such as urban crime. This study critically evaluates an innovative mixed-methods framework proposed by Garfias Royo et al. (2020), which combines household surveys, GIS-based heat mapping, and field observations to identify public spaces prone to violence against women under severe data limitations. While acknowledging the methodological limitations—such as over-smoothing in heat maps, lack of predictive capabilities, and observational biases—this paper argues that the low-cost, adaptable approach offers a practical model for evidence-based planning in data-poor contexts. Further, the essay extends the discussion by reflecting on the systemic roots of data scarcity, drawing parallels to cycle theft underreporting in Cambridge, UK, to illustrate that the issue transcends economic development levels and reflects deeper governance gaps. By situating the evaluation within broader debates on spatial analysis, social equity, and sustainable urban development, this study suggests that context-sensitive, hybrid methodologies could play a pivotal role in advancing resilient and inclusive urban futures in an era of multiple crises.

Keywords: Data scarcity; Spatial analysis; Gender-based violence; Sustainable cities; Resilience

169. Disaster Resilience and Sustainable Value of the Lougang Polder System: A Spatiotemporal Analysis of Floods and Droughts in the Taihu Basin During the Ming and Qing Dynasties

Authors: Huanjie Liu, Pesoa Marcilla Melisa, Rui Zhang, Yukun Zhang

Abstract: The Lougang polder system in southern Taihu Lake, located in Huzhou, China, is the only well-preserved and still-functioning lakeside polder landscape. Recognized as a World Heritage Irrigation Structure, it exemplifies a long-term sustainable approach to water management and agricultural production. This study examines the system's historical disaster resilience by analyzing the spatiotemporal patterns of floods and droughts during the Ming and Qing dynasties, when the system reached structural maturity. Using GIS and statistical tools, we compare upstream (Huzhou) and midstream (Yixing) regions to assess the relationship between hydrological risk and systemic response. Results reveal evolving patterns of climate-related disasters, a high degree of water coordination within the Lougang system, and strong disaster resilience supported by both infrastructure and management. This research highlights the historical adaptive capacity of a traditional agro-hydraulic system under climate stress and offers valuable insights for contemporary lowland resilience and food security planning.

Keywords: Lougang polder; Flood and drought; Disaster resilience; Taihu basin; Sustainable heritage

Session 15 Urban Resilience (Online)

170. Climate Adaptation and Spatial Resilience in Highland Settlements: A Case Study of Tibetan Tribal Systems in the Hehuang Region

Authors: Weijia Li, Pesoa Marcilla Melisa

Abstract: In the context of accelerating climate change and increasing ecological vulnerability, traditional highland settlement systems offer critical insights into sustainable human–environment relationships. This study focuses on the Tibetan tribal settlement system in the Hehuang region, located on the northeastern edge of the Qinghai–Tibet Plateau. By integrating historical documentation, spatial modeling, and environmental data, we examine the macro-scale spatial organization and resilience strategies embedded in the people–monastery–nature triad that defines this regional socio-spatial system.

Drawing upon point-based data of major tribal settlements from 1958 and selected Qing dynasty records, the research constructs a geospatial database of Tibetan settlement distribution. The analysis incorporates topographic adaptation, monastery centrality, and resource accessibility to evaluate systemic features such as inter-settlement cooperation, spatial hierarchy, and environmental fit. The results demonstrate that the Hehuang Tibetan settlement network exhibits a multicentric and adaptive spatial structure, characterized by strong alignment with natural boundaries and a distributed resilience pattern anchored by religious and ecological nodes.

This study contributes a spatially explicit framework for understanding culturally embedded resilience, emphasizing how decentralized religious infrastructures, ecological logic, and tribal governance co-produce a self-organizing system in fragile highland environments. These findings argue for the inclusion of historically grounded, culturally informed spatial systems into contemporary interdisciplinary approaches for climate-resilient regional planning, particularly in mountainous and ethnically diverse territories.

Keywords: Hehuang region; Tibetan settlements; Climate adaptation; Spatial resilience; People–monastery–nature system; Highland ecology; Distributed governance

204. Study on the Spatiotemporal Evolution and Driving Factors of Urban Resilience in China

Authors: Gang Deng, Rui Wang

Abstract: This study takes 283 prefecture-level cities across the country from 2009 to 2021 as samples, and uses the geographically weighted principal component analysis model to measure the level of urban resilience development in 283 prefecture-level cities in China, and studies in detail the spatial differences in urban resilience development among regions. Then, the spatial and temporal evolution characteristics of China's urban resilience development level were explored using ArcGIS natural break analysis, spatial trend surface analysis, standard deviation ellipse, and center of gravity migration trajectory. Finally, the driving and influencing factors of the spatial and temporal evolution of China's urban resilience development level were studied from the aspects of environmental regulation, industrial structure, scientific and technological innovation, economic development, level of opening up, climate policy uncertainty, and infrastructure, and relevant measures and suggestions were proposed to promote sustainable development among cities.

Keywords: Urban resilience; Spatiotemporal evolution; Driving factors

37. Urban Patterns of Development in the Coastal Zones of the South Aegean Islands: An Approach of Spatial Typology

Authors: Efstratia Chatzi, Sofia Zafeirelli

Abstract: The islands of the South Aegean region face increasing spatial pressures along their coastal zones, driven mainly by tourism and overall urbanization trends. This study investigates the building patterns in the coastal zones along the South Aegean based on a typological approach, classifying the coastal zone into urban, exurban and other coastal zones according to their coastal proximity, settlement boundaries and geomorphological features.

A 2025 high-resolution geospatial building footprint dataset, sourced from the Microsoft Building Footprints project, was incorporated using GIS tools to quantify development scale and density. This made it possible to calculate and compare buildings' density both within and between different coastal typologies and among the various islands

The results show differences both in the distribution of development between islands as well as in the different islands themselves, representing a mix of tourism pressures and geographical range. The findings underline the need for localized, tailored solutions to land use and coastal zone management. The result of this research underlined the urgent need for sustainable spatial management and planning of island areas that balances development with environmental protection and cultural preservation.

Keywords: Coastal zones; Urban sprawl; South aegean islands; Spatial typologies; Planning

38. Exploring Inclusive Design in the Renovation of Residential Spaces in Shanghai Workers' Villages: Addressing Aging and the Needs of Vulnerable Groups Under Multiple Crises

Authors: Li Lyu

Abstract: The construction of inclusive communities has become a key objective in global urban development. In China, the intensifying population aging has made addressing the housing needs of the elderly an urgent issue.This study focuses on Shanghai's Worker Villages, a specific type of old residential community constructed during the 1980s and 1990s. These communities have become key targets for the renovation of old residential communities. The uniqueness of these communities lies not only in their time-honored history but also in their socio-institutional origin. Initially built under the work-unit-based housing allocation system, this type of housing has become incompatible with the evolving demands of modern society following the market-oriented reform and housing commercialization. In the context of multiple crises—aging population, shortage of resources, and housing inequality—the physical and functional decline of Worker Villages is urgent for solutions.This study explores how inclusive design can be leveraged to improve the residential spaces within Shanghai's Worker Villages to better respond to the residential demands of diverse populations—particularly the elderly and vulnerable groups. This study draws on the approach combining quantitative and qualitative research. First, a spatial analysis of 311 Worker Village communities across Shanghai is conducted to identify functional deficiencies, spatial flow, and adaptability. Next, a snowball sampling method is adopted to carry out surveys and interviews with residents, intended to collect user experiences regarding current space usage and design improvements. Meanwhile, GIS technology is employed to assess the performance of renovation proposals in terms of their functionality, inclusivity, and spatial flow.The study aims to provide practical solutions for the renovation of old residential communities in Shanghai and similar cities. By promoting the application of inclusive design in urban renewal, the study seeks to address the social inequalities caused by aging and the needs of vulnerable groups.

Keywords: Inclusive design; Housing renovation; Aging issues; Vulnerable groups

49. Does Affordable Housing Exacerbate Urban Sprawl? Evidence From Chinese Cities

Authors: Yue Li

Abstract: Urban sprawl is a significant driving factor for the urban spatial disorder and social inequality. Existing studies have rarely analyzed its causes from the perspective of housing policy equity. This paper explores the impact of affordable housing supply on urban sprawl by integrating NPP-OLS nighttime light data, LandScan global population data, and panel data from 269 Chinese cities between 2012 and 2022, an empirical test is conducted. The results indicate that affordable housing supply significantly influences urban sprawl, with a 1% increase of affordable housing supply, urban sprawl increase by 0.116. The influence path result shows that affordable housing supply affects urban sprawl through two dimensions: construction methods and supply quantity. In terms of construction methods, the spatial spillover effect of affordable housing construction directly drives urban expansion. In terms of supply quantity, although short-term effects may alleviate urban sprawl by controlling housing prices, the long-term effect exacerbates urban sprawl as urbanization deepens. Furthermore, the impact exhibits significant heterogeneity in terms of industrial structure, urban size, and administrative level. This study concludes that the supply of affordable housing should break away from the path dependence of purely pursuing growth in construction indicators, and instead focus on aligning with the characteristics of urbanization stages. It also emphasizes optimizing the spatial layout of affordable housing to achieve the dual goals of housing equity and compact urban development.

Keywords: Affordable housing supply; Urban sprawl; Substitution effects; Spillover effects; Housing prices

62. Rethinking Urban Fragility Analysis: Responding to Fragility Challenges in South Sudanese Cities

Authors: Aditya Sarkar, Soraya Goga

Abstract: South Sudan's cities embody polycrisis. Although South Sudan is one of the least urbanized countries in the world, its cities are growing rapidly. Urbanization in South Sudan has been shaped by historical efforts by colonial powers to extract resources, and in more recent years, by recurring conflict and climatic and economic crises. Urban residents are poor, often food-insecure, have insufficient access to services, and face increasing crime and gang violence. Many have been displaced into cities from rural areas by violence, economic distress, or floods. At the same time, continued insecurity and social tensions make it difficult for researchers – including South Sudanese -- to conduct research in these cities. Without accurate analysis, how can South Sudanese and international development actors and policymakers respond to these fragility challenges? This problem is not unique to South Sudanese cities; similar challenges are faced by policymakers across fragile contexts in the global south.

This paper sets out a pilot methodology which can be adapted by policymakers and researchers for use across fragile urban contexts. It draws primarily on a year-long research project conducted by the World Bank (WB) using mixed methods across South Sudan's cities but also synthesizes lessons from WB research undertaken in other fragile African cities in Somalia, Nigeria, and across the Sahel. The paper summarizes some of the key definitional, methodological and epistemological challenges faced in urban fragility analyses, before outlining some strategies for overcoming these challenges. It argues for a heterodox approach using mixed methods including embedded political economic analysis, community mapping, and geo-spatial assessments. The paper concludes with some reflections on the concept of 'urban fragility' –pointing to its utility despite continued scholarly debates about its definition.

Keywords: Urban fragility; Methodology; Fragile cities; South sudan; Political economy

89. Parametric Urbanism and AI for Heritage-Centered Resilience: Mitigating Gentrification in Historic City Centers

Authors: Alejandra Duarte Montes, Juan Luis De las Rivas Sanz

Abstract: Historic urban centres, especially those declared World Heritage Sites, are facing increasing pressure from complex urban dynamics, such as touristification, rising land values, the expulsion of vulnerable populations and the loss of socio-cultural identity. These processes, often accelerated by decontextualised urban interventions, generate specific forms of heritage gentrification that threaten the habitability of these spaces. In the context of the urban 'polycrisis' - where climate change, social inequality, and housing crises converge - it becomes urgent to develop tools to anticipate and mitigate these risks.

This paper explores how parametric urbanism, combined with artificial intelligence (AI), can be used to detect spatial and socio-economic patterns in at-risk historic centres. Through the analysis of urban big data (census data, historical urban morphology, tourist flows, housing prices, mobility), predictive models are developed to identify areas of vulnerability or accelerated transformation. These models make it possible to design spatial intervention strategies that reinforce the habitational character of historic centres, avoiding their museumification or elitisation.

The research proposes a replicable methodological approach to diagnose and act in historic cities from the perspective of urban resilience and spatial justice. The aim is to offer a technological and context-sensitive alternative to preserve social diversity and the right to the city in highly pressured urban settings.

Keywords: Heritage gentrification; Parametric urbanism; Artificial intelligence; Liveable historic centres; Heritage gentrification

122. The Construction Wisdom and Inheritance Mechanism of Human Settlements Unit in Tibetan Border Towns in China

Authors: Jing Zhang, Yunying Ren, Yuchen Xia

Abstract: In view of the characteristics of small population, small scale and sparse distribution of Tibetan border towns in China, as well as the lack of traditional construction experience and the weak ability of suitability inheritance, combined with the theory of human settlements and spatial gene theory, the concept of human settlements unit of border towns is proposed. Taking Kejia in Ali as an example, based on high-resolution historical satellite images, field survey mapping data and ethnography, this study analyzes the performance characteristics of its construction experience in historical space, explores the spatial genes of human settlements units, and then analyzes its evolution mode and influencing factors, revealing the inheritance mechanism of the construction wisdom of human settlements units in Tibetan border towns, aiming to provide a basis for relevant research and practice. The study found that the spatial gene of the human settlement unit in Kejia is the result of comprehensive adaptation to ecology, culture and society, and its stability gene and variability gene exist at the same time. In the process of superposition from one-way dominance to two-way intervention and then to multi-level symbiosis, new genes do not negate old genes, but coexist with functional partition or technical substitution, forming a ' stable-adaptive ' complex spatial gene lineage. Through the stable inheritance of core spatial structure and spatial order, progressive technological improvement and material iteration, the deep maintenance of social and cultural elements and the dynamic adaptability of ecology-human settlements, the inheritance of construction wisdom and the inheritance of nature-settlement-state community are realized.

Keywords: Tibetan border towns; Habitat unit; Space gene; Construction wisdom; Inheritance mechanism

Session 17 Spatial Analysis for Sustainable Cities

19. Balancing Compact Urban Form and Ecology: A Spatial Analysis of Sustainability Trade-offs

Authors: Tianrui Sun

Abstract: Compact urban development is widely advocated as a sustainable model to curb urban sprawl, improve resource efficiency, and promote vibrant communities. However, concerns arise regarding its potential negative impacts on the urban environment. This tension exemplifies "sustainability trade-offs," where a gain in one dimension of sustainability may be accompanied by a loss in another. Using a grid-based spatial analysis, this study examines the sustainability trade-offs between urban compactness and ecology across Belfast, Glasgow, and Liverpool. Urban compactness is quantified through physical, functional, and economic dimensions, while ecology is assessed through ecosystem service indicators, including air quality, urban heat island intensity, NDVI and green space accessibility. The findings reveal spatial variations in the compactness-ecology relationship, highlighting both synergies and conflicts. This study underscores the complexity of achieving sustainable urban forms and provides insights for balancing densification strategies with ecological considerations in future urban planning.

Keywords: Compact cities; Sustainability trade-offs; Ecosystem services; Urban form

50. Spatiotemporal Relationship Between Green Product Trade and Air Pollution in China

Authors: Zining Wang, Pengyu Zhu

Abstract: Green product trade is often viewed as a pathway to decouple economic growth from environmental degradation. This study explores the spatial and temporal associations between green product trade and air pollutant emissions across 28 Chinese provinces from 2010 to 2022. Utilizing the Spatial Durbin Model and System Generalized Method of Moments, the analysis focuses on pollutants, including $PM_{2.5}$, PM_{10}, CO, SO_2, NO_x, and CO_2. Findings indicate that a 1% increase in green product trade is associated with a 1.1% reduction in $PM_{2.5}$ and PM_{10} concentrations. Moreover, green product imports in neighboring regions show stronger spatial spillover effects, correlating with approximately a 5% decrease in local emissions of $PM_{2.5}$, PM_{10}, CO, and SO_2. These patterns suggest that green product trade may contribute to regional environmental sustainability. This study offers empirical evidence for China's leapfrogging development in green technologies and lays a theoretical foundation for advancing international cooperation in green trade.

Keywords: Air pollutants; Green production; Spatiotemporal distribution

90. A Spatial Division Method for Urban Form Graph Modeling: A Case Study of Nanjing

Authors: Zihao Wu, Ziyu Tong

Abstract: Accurate comprehension of urban form at the urban scale is crucial for exploring microclimate effects. While dividing cities into spatial units and calculating indicators or types to characterize form is effective, previous studies often isolated each spatial unit, ignoring regional urban form interconnectivity. Graph modelling, which expresses urban form interconnectivity through node - edge connections, shows great potential in urban form cognition. However, for graph modelling, traditional methods of dividing spatial units have some limitations: regular grids damage architectural and urban topological integrity, and irregular neighbourhoods vary in size and may aggregate diverse building forms. To address these issues, this study proposes a sub-block boundary generation method combining Voronoi tessellation and spatial clustering based on buildings. Firstly, OSM data generates block boundaries. Then, using building footprints as the core, Voronoi tessellation divides the block into several building units. Next, this study defines sub-blocks as spatial aggregations of homogeneous building units. By applying spatial clustering algorithms, it aggregates adjacent building units with similar characteristics to form sub-blocks. Finally, the sub-block's spatial unit extent is used to calculate urban form indicators, converting them into graph nodes. Edges are generated via spatial adjacencies, constructing the whole urban form graph model. The results indicate that the proposed method successfully generates sub-blocks that fully encompass individual buildings, maintain the city's original topological relationships, and achieve a uniform size. Moreover, the urban form characteristics within each sub-block exhibit a relatively higher degree of consistency. These attributes enable a more precise and nuanced representation of the urban form and spatial neighborhood dynamics. This approach shows significant value for future urban-scale urban form cognition and can provide insights into microclimate research.

Keywords: Urban form; Spatial division; Urban scale; Graph modeling; Voronoi tessellation

100. Enhancing Urban Energy Resilience to Extreme Heat Events: An Agent-Based Model Simulation Study in Chongqing, China

Authors: Yueting Ding, Feng Chen, Zhaohua Wang

Abstract: Climate change is intensifying the frequency of extreme heat events, thereby exacerbating stress on urban building energy systems. Chongqing, a megacity highly susceptible to heatwaves in China, is experiencing escalating summer energy demands, highlighting the imperative for targeted policy interventions. Therefore, we develop an agent-based model to simulate building energy consumption under four high-temperature scenarios (36°C–42°C), and construct a multi-indicator resilience framework to and evaluate three mitigation policy strategies: adjusting temperature thresholds, establishing centralized heat-sheltering areas, and implementing electricity restrictions. We find that: 1) While uniform electricity restrictions and proportional 50% restrictions yield comparable resilience outcomes, the proportional strategy is more cost-effective and avoids oversupply risks, representing a more balanced approach. 2) Increasing the temperature threshold from 26°C to 28°C enhances system resilience with minimal incremental cost (performance score: 0.56) but are associated with substantial economic costs, whereas expanding heat-sheltering areas yields negligible system-wide resilience gains (<0.001). 3) Integrating resilience and cost via a TOPSIS-based method demonstrates that temperature threshold adjustments provide consistent resilience outcomes and superior cost-effectiveness compared to other strategies. Our study emphasizes the importance of integrating economic costs and implementation feasibility into urban resilience strategies, which provides theoretical and practical insights for building sustainable urban energy systems.

Keywords: Urban energy resilience; Policy strategies; Multiple indicators trade-offs; Agent-based modeling

Session 17 Spatial Analysis for Sustainable Cities

111. Proximity vs Presence: Evaluating the 15-Minute City in a Context of Urban Polycrisis

Authors: Kofoworola Modupe Osunkoya, Najmeh Mozaffaree Pour, Jenni Partanen

Abstract: The 15-Minute City (15MC) concept aims to create a compact, walkable neighborhood with basic services such as living, working, commerce, healthcare, education, and entertainment within a 15-minute walk or bike ride. In this context, it aims to mitigate car reliance, foster local participation, enhance urban resilience, and make cities socially vibrant by creating healthier and more sustainable places.

However, we don't know if people are more active in areas that fulfill the 15MC metrics and if these spaces are adaptive to polycrisis scenarios like climate change, social inequality, and economic instability. Therefore, as cities start restructuring space to align with this framework, a critical question remains understudied: Does proximity lead to presence? More specifically, do people truly use and occupy the areas that 15MC metrics suggest should be vibrant and active? How adaptive are these 15-minute neighborhoods to polycrisis?

Tallinn maintains green mobility policies, free public transit, and digital innovation but also faces polycrisis like energy insecurity, housing inequality, and demographic shifts. Tallinn's evolving infrastructure and polycrisis context fit into evaluating the resilience and behavioral validity of the 15MC model. To address this spatial-temporal alignment between 15MC accessibility metrics and human activity patterns in Tallinn, Estonia, we use geospatial data on points of interest (POIs) and anonymized mobile phone data to analyze and examine the high and low 15MC areas based on their accessibility score and identify gaps revealed by polycrisis scenarios.

Our study identifies where the 15MC framework aligns with real activity, where it breaks down, and how it reacts to polycrisis scenarios. Finally, it informs more grounded and adaptable planning practices, highlighting the need to plan for proximity and presence in a rapidly changing urban landscape.

Keywords: 15-minute city; Urban vitality; Proximity; Polycrisis; Urban data analytics

201. A Spatially Explicit Heat-Health Data-Driven Vulnerability Index for Hong Kong: Integrating Mortality Data and Local Context

Authors: Maoping WANG

Abstract: The Heat Vulnerability Index (HVI) typically integrates indicators of heat exposure, sensitivity, and adaptive capacity. However, few studies incorporate actual health data, such as heat-related mortality, to identify more reliable vulnerability drivers and inform effective mitigation strategies. Moreover, vulnerability drivers may vary spatially due to different socio-economic and environmental contexts, requiring locally specific interventions.

This study addresses these gaps by incorporating 2021 heat-related mortality data from Hong Kong to establish a localized HVI indicator framework at the tertiary planning unit (TPU) level. First, spatial multivariate regression was conducted to relate heat-related mortality ratios to socio-economic status (SES) and surface land use patterns corresponding to the Local Climate Zone (LCZ) system, identifying relevant HVI indicators. Second, factor analysis reduced these indicators into three principal components: exposure, sensitivity, and adaptive capacity. Third, using these locally relevant indicators and their weights, a TPU-level HVI was calculated to produce an updated HVI map to evaluate the potential heat vulnerability of future urban planning schemes, which were extracted using a large language model (LLM) from the Hong Kong Planning Department's urban planning outlines.

The results reveal that (1) HVI indicators are spatially heterogeneous across Hong Kong. For instance, in southeastern Kowloon, which has higher heat-related mortality, HVI drivers include exposure (mean LST), sensitivity (elderly population ratio, mean household income, employment ratio), and adaptive capacity (LCZ classes A-B, C, and G). In contrast, different indicators shape vulnerability in the New Territories. (2) The updated HVI map, which integrates future planning schemes, reveals that some TPU regions are projected to improve in heat vulnerability, while others may face increased risk due to planned reconstruction or expansion.

These findings provide valuable insights for planners and public health professionals to accurately identify heat-risk regions and implement targeted interventions that can effectively reduce heat-related mortality in Hong Kong.

Keywords: Heat vulnerability; Heat-related mortality; Spatial heterogeneity

Session 18 Spatial Perception and Urban Experiences

73. City Image Production Regime Through New Media: An Unsupervised Machine Learning Approach

Authors: Jiemei Luo, Peiheng Yu, Ziyu Chen, Tianchen Dai

Abstract: Image making is essential in urban (re)development, especially in attracting investment and consumption for entrepreneurial cities. The rise of new media poses new challenges for urban governance in city mage production regarding generated image and (uneven) power relationships. To better capture the image characteristics and relationship within the urban regime in the new media age, this study analyzed two newly regenerated hip neighbourhoods, Yuyuan and Xinhua, in Shanghai, China. Both cases are conservation areas and have become wanghong destinations in recent years after urban regeneration and media marketing. An unsupervised machine learning approach, topic modeling (TM), including text over time and part of speech, is adopted to analyze the new media texts. Two regimes with public-private–social sectors and related WeChat Public Accounts (WAs) were identified from second-hand documents and interviews. Eleven WAs of the image production regime and 1945 posts from 2014 to 2021 were analyzed by TM, which emphasizes the content strategically produced by related sectors rather than user-generated content. Two cases produced similar aesthetic images as "nice (美好), collaborative (共同), and neighbourly (友好)". These aesthetic images endorse the taste of young professionals and the middle-class, successfully transforming two old residential districts into popular consumption destinations. However, a taste distinction is observed between residents and newcomers, possibly resulting in social exclusion. The targeted image among sectors in one regime varies, reflecting the heterogeneous core interests and possible competing relationships. This study extends the application of machine learning in urban studies by understanding new media image production regimes. It also provides a reference for future urban governance and public policies that utilize new media tools, especially when involving multiple sectors beyond the state that seeking to achieve collaborative and inclusive governance.

Keywords: Machine learning; City image; New media; Social resilience; Equality

81. Gendered Differences in Social Networks and Varied Leisure Participation Among Migrants in Urban China

Authors: Shan Yu

Abstract: Leisure participation is not solely a matter of personal preference but also embedded within social networks, gender dynamics, and systemic constraints. This study explores the impact of social networks on leisure participation among urban migrants in China, with a specific focus on gender differences. Using data collected from a questionnaire survey conducted in Wuhan, the analysis examines the diversity, intensity, and types of migrants' leisure activities and how they are shaped by migrants' connections with locals and other migrants. The findings reveal significant gender differences in leisure participation: women exhibit higher participation in active leisure activities, while men are more engaged in social leisure activities. Passive leisure activities are prominent among both genders. As for social networks, female migrants demonstrate stronger kin-resident ties and higher upper reachability, challenging the stereotypes of dependency and highlighting their agency in navigating urban environments. In contrast, male migrants benefit from broader professional networks and kin-resident ties, which enhance their leisure diversity and intensity. These results offer insights into how social structural factors shape gendered urban experiences of migrants and provides evidence for inclusive policies that address gendered leisure dynamics to improve migrants' well-being and integration.

Keywords: Social network; Leisure activities; Gender differences; Urban migrants

Session 18 Spatial Perception and Urban Experiences

113. Spatial equity of perceived cultural ecosystem services in urban parks based on social media data: A case study of Turin, Italy

Authors: Jingxiong Huang, Xinwen Zhang, Jiaqi Liang, Anrong Dang

Abstract: Urban parks are essential providers of cultural ecosystem services (CES), yet the ways in which these services are perceived and distributed remain insufficiently understood. Existing studies often overlook visitors' subjective perceptions, leading to potential underestimation of service diversity and equity issues in service allocation. Taking urban parks in Turin, Italy as a case study, this paper draws on Google Review social media data, using natural language processing, keyword classification, and sentiment analysis to identified both the perceived frequency and satisfaction ratings of different CES in Turin. A road-network-based Gaussian two-step floating catchment area analysis was employed to incorporate accessibility weighting, thereby quantifying the spatial distribution of residents' accessible CES perceptions. Equity in CES provision was further assessed through Lorenz curves and Gini coefficients. Building on these results, an Importance–Performance Analysis (IPA) was conducted by linking perceived frequency with satisfaction scores, in order to diagnose priority areas for improving CES provision in terms of both equity and visitor satisfaction. The findings reveal distinct spatial disparities in CES supply across Turin's parks, highlighting inter-park differences and underscoring the need for culturally sensitive and equitable park planning. Methodologically, this study demonstrates the value of integrating text mining, sentiment analysis, and equity metrics, and emphasizes the importance of a perception-based perspective in advancing CES assessment. Practically, the results provide actionable evidence for policymakers seeking to balance ecological conservation with the equitable distribution of cultural benefits under rapid urbanization.

Keywords: Cultural ecosystem services, landscape ecology, text mining, accessibility, equity, urban parks

125. Investigating Walking Behaviour and Perceived Walkability of Older Citizens in London

Authors: Guanhua Zhao, Mengqiu Cao, Jonas De Vos

Abstract: There is an emerging imperative to design walkable communities catering to older adults, particularly given the context of an increasingly aging population. However, studies of how older citizens perceive walkability remain scarce. Therefore, this study aims to identify the factors that influence walking behaviours and perceived walkability among senior citizens, whilst also illuminating the associations between them. A quantitative analysis was conducted on 200 older individuals living in Ealing, London, an area with a large proportion of senior citizens. Utilising the self-developed Neighbourhood Environment Walkability Scale for Older Adults (NEWS-OA), based on the abbreviated version of NEWS, both linear and logistic regression models were employed to decode the data. Our results show that NEWS-OA is appropriate for assessing perceived walkability among senior citizens and reveal concerns regarding traffic safety. Communities with high walkability are likely to encourage an extended distance, duration, and frequency of walks. However, socioeconomic status (SES) was found to have a less pronounced effect on walking frequency and distance. The study further demonstrates that perceptions of safety were lower among older adults with a high SES. We found that positive perceptions of all the variables tested, except Aesthetics, encouraged walking. Furthermore, the study reveals the crucial influence of these perceptions on older adults' inclination to walk for various purposes, such as the role of perceived safety in terms of social interaction. This study offers insights that can be used to make London a more age-friendly and walkable city. It can also serve as a reference for other cities to enhance inclusiveness.

Keywords: Travel behaviour; Built environment; Older adults; Perceived walkability; Neighbourhood walkability

Session 18 Spatial Perception and Urban Experiences

149. Thermal-Humidity Dynamics in Tunnel Construction Environments: A Multi-Physics Coupling Analysis for Ventilation and Condensation Control

Authors: Xueyan Liu, Zhiwen Luo, Tianyi Zhao

Abstract: In tunnel construction, high-temperature and high-humidity environments pose significant threats to equipment operational performance and personnel safety. To accurately evaluate thermal-humidity conditions, this study employs COMSOL Multiphysics to develop a 3D transient model integrating multi-physics simulations of heat transfer, moisture migration, non-isothermal airflow and seepage dynamics. The investigation focuses on the coupled interactions between fluid flow and thermal processes in the critical zone spanning the tunnel face (excavation front) to the secondary lining trolley (lining installation area). Through systematic analysis of spatiotemporal temperature and humidity distributions across representative cross-sections, seasonal variations both in winter and summer conditions were quantitatively characterized. Our results revealed that the tunnel face is the primary source of heat and humidity, with significant non-uniform flow fields observed at both the tunnel face and the duct outlet, the latter reaching a maximum airflow velocity of 14.5 m/s and forming an intense heat exchange zone. Extreme heat flux values of -4.98×10^5 W/m² (winter) and -6.11×10^5 W/m² (summer) were identified in the vent-pipe reflux region. Notably, summer temperatures at the vent-pipe cross-section 20 m from the tunnel face consistently dropped below the dew point, while winter condensation risks emerged within the first 76 minutes of simulation. These findings establish a robust numerical model for environmental parameters in construction tunnels, providing a theoretical foundation to optimize ventilation strategies and develop seasonal anti-condensation measures under complex geological conditions.

Keywords: Tunnel construction environment; Heat and humidity perturbation law; Spatiotemporal distribution; Multi-physics simulations

221. Procedural natural scene construction

Authors: Chen Zhang, Fu Ren, Renzhong Guo

Abstract: Perception and graphic technologies have accelerated the generation and accumulation of 3D data. For cartography, one notable change is that 3D maps are increasingly pursuing a sense of immersion and realism. However, the production process of 3D maps is quite challenging: from terrain and roads to flowers, trees, and various other geographical elements, all need to have corresponding digital representations in the map. The types, quantities, and characteristics of different geographical entities bring numerous challenges to the mapping pipeline. This paper delves into the data structures and expression methods of typical geographical elements in 3D graphics engines. On one hand, it reverse-engineers the source data required in the mapping process based on the mapping data structure. On the other hand, with the support of technologies such as procedural generation and physically-based rendering, it builds the generation methods for different types of elements based on the data structure, focusing on meeting the needs of 3D maps in photorealistic visualization. This paper discusses the expression systems of typical elements such as roads, terrain, grasslands, vegetation, and water bodies, and on this basis, initially develops an automatic mapping pipeline for 3D maps. Finally, from a broad cartographic perspective, it considers the innovative value of this research for cartographic theory and application, and proposes key issues to be addressed in subsequent research.

Keywords: 3D scene construction; Reductionism; Photorealism; Digital twin; virtual geographical environment

4. The Impact of Rural Digitalization on Public Service Resilience: A Case Study of the Yangtze River Economic Belt Region

Authors: Jiaying Li, Yirui Jiang

Abstract: Currently, the rapid advancement and extensive application of digital technologies, including big data, cloud computing, 5G and artificial intelligence, have created new opportunities for agricultural and rural modernization. As a result, digital village development has become a key driver in advancing rural revitalization and advancing the digital transformation of rural areas. The concept of the digital village involves using digital technology to enhance public services and promote regional development, covering aspects such as infrastructure, healthcare, education, communication, and transportation. The digital transformation of rural areas through 'digital village' initiatives has fundamentally reshaped the landscape of public service delivery and resilience in rural communities. While these initiatives have expanded digital public service coverage, the empirical evidence regarding their impact on rural public service resilience remains understudied. This study addresses this critical gap by examining the relationship between digital village construction and public service resilience across 110 cities in China's Yangtze River Economic Belt from 2013 to 2021. The study employs the Driver-Pressure-State-Impact-Response (DPSIR) framework to assess rural public service resilience, combined with a double machine learning causal inference approach. The findings reveal that digital village construction significantly enhances rural public service resilience, particularly in driving forces, impact metrics, and response capabilities. The analysis identifies three primary mechanism pathways through which this enhancement occurs: digital financial inclusion, enhanced local governance efficiency, and accelerated technological innovation. Additionally, urbanization emerges as a key moderating factor in the relationship between digital village initiatives and public service resilience. The study provides policymakers with actionable insights for optimizing digital village construction to improve public service resilience, particularly in regions with varying urbanization levels. The established evaluation framework and identified mechanism paths offer valuable tools for implementing targeted digital initiatives that effectively enhance rural public service systems, contributing to more resilient and sustainable rural development.

Keywords: Digital transformation; Digital village construction; Public service resilience; Yangtze river economic belt

5. Green Finance and China's Urban Carbon Unlocking: A Quasi-Nature Experiment Based on Government and Market Moderating Effect

Authors: Jingjie Zhou, Xuanyan Chen, Shaozhou Qi

Abstract: China's reliance on fossil fuels significantly hinders its transition to a low-carbon economy, requiring comprehensive carbon reduction strategies. In response, the 2017 Green Finance Reform and Innovation Pilot Zones (GFRIPZ) policy was introduced to promote green development through supply-side financial reforms and innovations. This study examines the causal impact of GFRIPZ on urban carbon unlocking (UCU) using a difference-in-differences (DID) model with panel data from 283 Chinese cities. We further explore the policy's impact mechanisms, variations across cities, and the moderating roles of fiscal decentralization and digital finance. The results show that (1) GFRIPZ significantly promoted UCU; (2) Its effect is stronger in Guangdong and Zhejiang pilot zones, as well as in eastern, larger, and more open cities with non-resource-based and non-old industrial cities; (3) The policy enhances UCU through green technology innovation, government leadership, and public green behaviors; (4) Fiscal decentralization and digital finance positively moderate its impact. These results highlight the role of GFRIPZ in accelerating carbon unlocking and provide insights for sustainable urban development.

Keywords: Green finance reform and innovation pilot zones; Urban carbon unlocking; Fiscal decentralization; Digital finance

162. Evidence of Public Expenditure Spillovers in Mexico: Measuring the Spatial Interactions Among Municipal Governments

Authors: Alejandro Moreno Jimenez

Abstract: This paper investigates the presence and nature of public expenditure spillovers among municipalities in Mexico from 2000 to 2021. Using dynamic spatial panel data models with common factors, it estimates the spatial and temporal interdependence in municipal spending across four expenditure categories: total expenditure, use of services, gross capital formation, and subsidies and social benefits. Results show that municipal governments exhibit incremental spending behavior and that public goods are largely complementary across space, with significant direct and indirect effects driven by employment rates, household income, federal transfers, and population density. Notably, federal transfers have the strongest effects on gross capital formation and use of services expenditures.

Keywords: Public expenditure spillovers; Local government expenditure; Spatial econometrics; Fiscal interactions

171. Data Usage in Housing Policymaking in Sheffield

Authors: Enes Aydin

Abstract: Housing policies may construct and legitimise housing affordability through the selective use of datasets, such as energy metrics, income indicators and local allocation frameworks, each potentially carrying varying degrees of influence in the policymaking process. In this context, data can help to determine challenges and shape the political imaginaries that inform housing policy responses. This paper presents research investigating how evidence is produced, interpreted and mobilised by housing policymakers in Sheffield, with a particular focus on the rationale behind data selection and the practices that influence the formulation and justification of strategies aimed at mitigating housing inequalities. The study is based on ongoing fieldwork, including semi-structured interviews with local housing officers and policymakers; participant observation during stakeholder meetings and inter-institutional workshops; and policy analysis. Preliminary findings suggest that the selective use of data, with certain datasets such as energy efficiency metrics influencing policy narratives, while others, especially those concerning vulnerable communities, remain underutilised due to ethical, institutional, political or expertise-related concerns. Furthermore, inter-agency data sharing may be uneven and the use of evidence may be shaped by underlying narratives that determine whether data informs policy development or is employed to legitimise pre-existing positions. Findings imply that incomplete data may lead to unrecognised challenges in policymaking or support pre-existing biases, notably in some of the allocation frameworks influenced by prevailing perspectives. Ultimately, the study contributes to the literature by critically examining the interplay between data and housing policymaking. It underscores that evidence is not necessarily neutral per se, but rather may be embedded in normative processes that consecutively shape residents' housing trajectories. Subsequent research might examine how collective imaginaries associated with certain urban areas potentially constrain policymakers' ability to integrate robust evidence in housing policy-making processes.

Keywords: Housing policy; Housing inequalities; Data use; Evidence-based policymaking

173. Between Deliberation and Aggregation: Rethinking Decision-Making Sphere of Public Participation in China's Urban Regeneration

Authors: Houwei Fu

Abstract: Urban regeneration constitutes a multidimensional process encompassing both physical transformation of unused or underused sites and intricate economic, social, and political transitions. Addressing these challenges requires inclusive and adaptive decision-making processes that leverage collective wisdom. With the proliferation of digital technologies, social media has emerged as a transformative tool in collaborative urban governance, reshaping how diverse stakeholders communicate, deliberate, and participate in decision-making. Despite growing interest in digital participation, limited research has examined how social media influences the power dynamics and redistribution inherent in collective decision-making within public participation processes. Grounded in Habermas's theory of communicative rationality, this study conceptualizes public decision-making through two distinct modes: deliberative approaches and aggregative approaches. Social media thus serves as both a communicative infrastructure and a repository of public opinion, facilitating discursive engagement and enabling data-driven consensus. This research is exemplified through a comparative case study of urban regeneration projects: Siping Road, Shanghai and Enning Road, Guangzhou. A mixed-methods approach is employed to examine how collaborative decision-making unfolds across social media platforms. Major methods include social network analysis, content analysis of social media data, and digital ethnography to map stakeholder engagement pattern and power (re)distribution dynamic. Data will be mainly collected from public platforms such as Weibo, supplemented by policy data of planning, and embedded participatory tools such as digital polls or voting applets. The study aims to reveal how deliberative procedures are reflected in more inclusive dialogues, agonistic interactions, and collective knowledge production, while aggregative processes emerge through real-time feedback and the convergence of widely preferred options. It argues that deliberative and aggregative modes of decision-making are not mutually exclusive but are, in practice, increasingly intertwined. Ultimately, this research advocates for a hybrid model of participatory decision-making—integrating both deliberation and aggregation—to promote more democratic, responsive, and effective urban regeneration.

Keywords: Social media; Public participation; Decision making; Urban regeneration

211. Unravelling the Demand-Side Role in Urban Green Space Equity: A Decade of Policy Suggestions Related to Public Health in China

Authors: Puyue Gong, Jinliu Chen, Weipeng Han, Jiming Zhu

Abstract: Urban greenspace plays a key role in promoting public health and human well-being. In recent years, both central and local governments in China have worked to improve equitable access to greenspaces through policy interventions. Meanwhile, there has been growing recognition of the importance of public voices—especially from the demand side—in shaping policy. Although the "Two Sessions" system serves as a major institutional platform for representatives to submit policy suggestions aimed at improving public services, topics on the connection between greenspace and health are still rarely mentioned in health-related policy suggestions. This study uses large language models to analyze 19,493 policy suggestions submitted between 2011 and 2022, categorizing their content and constructing a geographic interaction matrix to assess regional relevance. It combines this with remote sensing data to evaluate greenspace development using the Greenspace Equitable Development Index (GEDI), which measures both diversity and accessibility. Using Fixed Effects (FE), Gaussian Mixture Models (GMM), and Multi-Scale Geographically Weighted Regression (MGWR), the study investigates how "Two Sessions" suggestions (TSS) influence urban greenspace. The results show that public health-related TSS positively affect greenspace expansion, particularly those focusing on social development, law, industry, and economy. Over time, such influence has spread from southern and western China to a national scale. Moreover, the impact of TSS is more significant in the second year after submission, while individual suggestions have limited immediate effects. These findings highlight that greenspace, though rarely mentioned directly, serves as a key strategy for advancing health outcomes. To strength this impact, health policymakers should integrate greenspace more explicitly into planning, and representatives should offer more targeted and actionable policy suggestions.

Keywords: Two sessions system; Demand-side impact; Greenspaces equitable development index (GEDI); Policy making; Gaussian mixture model (GMM); Multi-scale geographically weighted regression (MGWR)

Session 20 Applied Urban Data Analytics (Online)

29. Pedestrian-Centric Modeling of Air Pollution Exposure in Complex Urban Environments

Authors: Feifeng Jiang

Abstract: Urban pedestrians face heightened vulnerability to air pollution due to their proximity to emission sources and elevated respiratory activity during movement—factors often neglected in conventional, residence-based exposure assessments. This study proposes an integrated methodological framework that combines graph-based machine learning with computer vision techniques to quantify pedestrian exposure at fine spatial granularity across complex urban settings. Street-level pollutant concentrations are derived from mobile sensing data captured by vehicle-mounted sensors, with spatial interpolation enhanced through graph-based ensemble modeling. Pedestrian activity is estimated by integrating high-resolution street view imagery with ground-truth sensor counts, enabling scalable and granular mapping of foot traffic patterns. Applied to a case study in New York City, results reveal that pedestrian exposure is shaped not only by pollution intensity but by the spatial convergence of human mobility and emission sources, uncovering activity-driven exposure hotspots often missed by traditional models. By advancing a mobility-aware approach to exposure assessment, this study offers a transferable toolset for urban health diagnostics and informs equitable, evidence-based strategies in pedestrian-oriented planning and environmental justice.

Keywords: Air pollution; Pedestrian activity; Exposure assessment; Urban planning; Environmental justice

36. Detecting Real Events vs Sensor Anomalies in Smart Cities: A Spatio-Temporal Approach During the 2021 Athens Wildfires

Authors: Sofia Zafeirelli, Efstratia Chatzi, Dimitris Kavroudakis

Abstract: Low-cost environmental sensors provide real-time monitoring over smart cities, but reliability of information is often undermined by anomalies. This paper discriminates between outliers induced by noisy sensors and actual environmental occurrences, such as forest fires, using three outlier detection methods: Interquartile Range (IQR), Local Outlier, and Global Outlier approaches. These were implemented over Particulate Matter (PM1.0, PM2.5, PM10.0), temperature, and relative humidity from PurpleAir sensors over Athens, Greece in the fires of August 2021. Results show that the IQR method captures transient event-related pollution peaks well, which makes it appropriate for representing event-related anomalies such as dispersion of smoke. Microclimatic changes and small-scale anomalies are captured by the Local Outlier approach, albeit with an increased number of false positives. Persistent or large-scale deviations are detected by the Global Outlier approach, undercounting quick, localized changes. A combination of these approaches could make sensor networks in urban areas more robust with respect to reliability. This research adds to environmental event detection in real time and aids in establishing better early-warning systems in infrastructures of smart cities.

Keywords: Smart cities; Environmental monitoring; Outlier detection; Forest fire event; Spatio-temporal analysis

60. Mobile Signaling Data Reveals Hidden Healthcare Resources Disparities: Evidence From Shenzhen, China

Authors: Xiaohui Ma

Abstract: The social equity of healthcare resource allocation has long been a critical objective in sustainable urban development. While traditional studies predominantly measure equity through geographic accessibility, they often overlook its alignment with actual healthcare-seeking behavior, potentially leading to misjudgments in resource distribution fairness. To address this gap, this study develops a novel analytical framework integrating Location-Based Service (LBS) data and AMAP route planning, using Shenzhen, China, as a case study. This approach captures the interaction patterns between residents and medical facilities, revealing spatial heterogeneity in real-world healthcare utilization. Key findings include:

(1) Mobility-based interaction distancesexhibit significant spatial deviations from conventional accessibility measures, highlighting limitations in traditional assessments.

(2) Cross-district healthcare visitsare prevalent, constituting 43.7% of total visits - a pattern not captured by administrative-boundary analyses. (3) A robust negative correlation exists between interaction distance and income levels ($R^2 = 0.27$, $p<0.01$), revealing systemic spatial inequities inhigh-quality healthcare access. (4) Facility capacity and service quality emerge as key drivers of this disparity, suggesting that resource allocation policiesmust consider both quantity and quality dimensions. These insights enable the identification of hidden underserved populations and provide empirical support forevidence-based policy making to advance healthcare equity and sustainable urban development.

Keywords: Urban sustainability; Healthcare equity; Actual healthcare-seeking behavior; Big data

154. The Spatial Restructuring Effects of Online Food Delivery on Urban Food Environments: A Case Study of Hangzhou

Authors: Li Chen, Haoying Han, Wanglin Yan

Abstract: Digital technologies are profoundly reshaping the spatial structure and social equity of urban food environments through online food delivery services. Taking the central urban districts of Hangzhou as a case study, this research integrates multi-source data—including Meituan delivery records, Dianping restaurant listings, community attributes, and mobile phone signaling data—and applies spatial analysis and machine learning methods to systematically examine how online food delivery reconstructs spatial accessibility, diversity, and affordability of food. The study introduces three major innovations: (1) moving beyond traditional central place theory by constructing segmented decay functions to accurately delineate online delivery service boundaries and reveal a "spatial folding" effect; (2) developing a high-precision data fusion technique using fuzzy matching and the Hungarian algorithm to spatially align online and offline restaurants; and (3) proposing novel spatial indicators such as restaurant digitalization rate and service coverage gain rate to quantify the differentiated impact of digital services on local food environments. Empirical findings reveal four key insights: (1) online food delivery substantially enhances food accessibility across all communities, with the most significant improvements observed in suburban and non-central neighborhoods; (2) it partially improves food affordability, notably lowering the price threshold of mid- to high-end dining, though the impact on staple and low-cost foods is limited, and in some cases, prices even rise; (3) in terms of spatial equity, while overall Gini coefficients of food access decline, indicating improved fairness, the system may simultaneously intensify disparities between urban and rural areas as well as among communities of different qualities within city centers, particularly through a "bottom collapse" phenomenon in the supply of affordable foods; and (4) suburban and newly developed communities demonstrate higher dependence on online food delivery, yet the degree of digitalization among nearby restaurants lags behind. Building on these findings, the study recommends that policymakers focus on promoting the digitalization of affordable food services in suburban areas to address the new challenges posed by urban expansion and to advance a more equitable and efficient urban food environment.

Keywords: Online food delivery; Food environment; Spatial restructuring; Central place theory; Hangzhou

183. Spatial Mismatch and Attribution Analysis of Flood Risk and Resilience in Megacities: Insights From a 'Risk-Resilience-Effect' Framework and an Interpretable XGBoost-SHAP Model

Authors: Shengwang Bao, Chengzheng Yu, Zhenyang Wan

Abstract: Under the dual pressure of global climate change and rapid urbanization, urban flood risk has become one of the major natural disasters threatening megacities. Taking Beijing as an example, this study constructs a comprehensive "Risk-Resilience-Effect" framework to systematically evaluate the spatio-temporal evolution and interaction mechanism of flood risk and resilience from 2010 to 2020. Based on the MaxEnt model and interpretable XGBoost-SHAP model, this study reveals the trade-offs and synergies between flood risk and resilience, and quantifies the nonlinear threshold effects of key influencing factors. The results show that: (1) The urban flood risk presents significant spatial differentiation, with the highest risk increasing in the southwest (+4.145%,), followed by the east (+2.38%,), forming a "southwest-east" oriented axial expansion pattern. (2) The overall resilience shows an upward trend (a 2.03% increase in 10 years), but the spatial distribution shows differentiation. The Xicheng District declined significantly (-0.72% per year,) with resilience center migrating 247 meters to the northwest. (3) A significant trade-off effect between flood risk and resilience is revealed () with spatial heterogeneity. (4) The inhibitory effect of resilience on flood risk is significantly enhanced with the threshold of 0.12, while the peak volume of rainfall shows an obvious disaster triggering effect near 33.04 mm. This study contributes to the literature by considering flood risk and resilience into a unified systematic framework, revealing the disaster-resilience interaction mechanism in megacities, and providing a scientific basis for optimizing of disaster prevention.

Keywords: Flood risk; Resilience; Xgboost-shap machine learning interpretation framework; Trade-off and synergy effect

185. The Equity Impact of Bike-Sharing on Developing X-Minute Cities: A Case Study of 36 Counties and Districts in China

Authors: Wenyan Fu, Yongping Zhang

Abstract: The "10, 15, or 20-minute cities" concept aims to reduce emissions and achieve sustainable urban planning by encouraging active travel modes (walking and cycling). For generality, we refer to it as the X-minute city, a city where residents can obtain essential amenities within X minutes from their homes. Most existing studies focused on assessing the X-minute city by walking or private biking directly from home, while there is a lack of methods to consider the potential of bike sharing, which requires time to acquire. With the development of bike sharing, it is necessary to evaluate how this emerging mobility mode supports the development of X-minute cities. In this study, we measure X-minute cities and evaluate their equity performance by considering bike-sharing at both local and city scales in China. The study can provide valuable insights for urban and transport planning and policy-making to develop X-minute cities.

Keywords: Equity; Bike-sharing; X-minute cities; China

Session 21 Demography and migration

47. Reimagining Sustainable Cities: Advancing Migrant Inclusion in Urban Sustainability

Authors: Mohammad Anwar Fetrat

Abstract: Urban sustainability is a core ambition of Sustainable Development Goal 11 (SDG 11), which aims to make cities inclusive, safe, resilient, and sustainable. Central to this ambition is the commitment to inclusivity, with migrant communities playing a pivotal role by contributing to urban economies, cultural diversity, and social cohesion. Despite their expanding role and capabilities, migrants continue to face systemic barriers such as structural inequalities, social and economic barriers, limited political representation, and linguistic and cultural exclusions. The main objective of this qualitative study is to address these challenges by bridging the gaps within the current SDG 11 targets: the lack of meaningful migrant inclusion in shaping sustainable cities, particularly their inclusion in urban decision-making processes. Drawing on an interpretivist-constructivist paradigm, data were gathered from in-depth semi-structured interviews and analysed through the lens of thematic analysis to examine how SDG 11 is understood, implemented, and experienced locally. Grounded in Social Capital theory, the research findings highlight the need for a comprehensive multi-stakeholder approach by examining six key areas as emerging pathways toward inclusive urban sustainability: 1) Holistic and inclusive policy frameworks, 2) Inclusive approaches to urban planning, 3) Participatory governance mechanisms, 4) Countering cultural and social barriers, 5) Tackling socioeconomic and spatial inequalities, and 6) Community-driven initiatives. The study also reveals a pressing need for translating the SDGs' technical language into a simple and accessible language in line with local realities that resonate with diverse communities. Finally, the results point to the need for further integration between the Scottish national and local polices with the SDG 11 targets and indicators.

Keywords: Inclusive urban sustainability; SDG 11; Migrant inclusion

168. Spatial Demographics and Cultural Entrepreneurship in Barcelona's Ethnic Enclaves: Data-Driven Analysis of Migration Patterns in the Fondo Neighborhood

Authors: Mingqing Yin, Lluís Frago i Clols

Abstract: Urban ethnic enclaves represent crucial sites for understanding contemporary migration dynamics, cultural integration processes, and entrepreneurial adaptations in global cities. This study presents a data-driven analysis of Barcelona's Chinese community in the Fondo neighborhood, employing spatial demographic techniques and mixed-methods approach to investigate the relationship between migration patterns, consumption behaviors, and place-making strategies. Using census data (2014-2022), business registries, and qualitative interviews, we map the spatial concentration of Chinese immigrants in Fondo and analyze how this demographic presence translates into distinctive commercial landscapes and cultural spaces. Our findings reveal that Chinese migrants have established significant entrepreneurial clusters within specific micro-geographies of the neighborhood, with 615 Chinese residents in one census section alone - representing over 21% of that section's population. The research identifies three distinct spatial patterns: (1) commercial concentration zones where Chinese businesses serve both co-ethnic and mainstream consumers; (2) residential settlement areas characterized by varying degrees of socio-economic integration; and (3) emerging cultural spaces where traditional and hybrid practices converge. These patterns demonstrate how migration-driven demographic changes are reshaping urban consumption practices and transforming neighborhood identity. By analyzing high-resolution spatial data alongside ethnographic insights, this study contributes to theoretical understandings of how migration influences urban transformation through the lens of everyday economic and cultural practices. The findings provide valuable insights for urban planners and policymakers seeking to develop inclusive approaches to neighborhood development in increasingly diverse urban contexts, while demonstrating the utility of combining quantitative spatial analysis with qualitative cultural interpretation in migration studies.

Keywords: Urban migration; Ethnic entrepreneurship; Cultural space; Spatial demographics; Chinese diaspora

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180. Urban Nature and the Mental Health of Migrants: The Roles of Sense of Place

Authors: Qingyue Xue, Ben Wheeler, Lucy Szaboova, Sarah Bell

Abstract: Introduction: Mental health problems faced by immigrants in urban environments with cultural differences are multifaceted. Sense of place is a guiding principle of the environment and contributes to psychological status and social cohesion. Urban nature has been shown to promote mental health and wellbeing, but its impact on migrants, specifically through the lens of "sense of place" remains underexplored.

Objectives: This study focuses on mental health, migration, exploring urban nature's role in shaping sense of place among Chinese migrants. Recognising the large and growing body of evidence suggesting potential mental health benefits of time spent with nature, this research aims to investigate how does urban nature influences migrants' sense of place, and consequently, affects their mental health and wellbeing.

Methods: A mixed-methods approach is employed, combining quantitative data analysis with qualitative interviews. Data has been collected from migrants residing in diverse urban areas, with measures of secondary data regression analysis complementing participant data from fieldwork surveys to contextualise findings.

Results: Preliminary analysis is expected to reveal that migrants who report a strong sense of place in urban nature enhanced mental health outcomes with lower stress levels and higher life satisfaction. Trends may also indicate differences dependent on urban space access, quality, and cultural relevance.

Conclusions: This study will contribute to migrants' mental health benefits of urban nature, and the effectiveness of sense of place. It also offers insights into how urban planners and policymakers can design inclusive urban nature spaces that support the wellbeing of diverse populations, particularly migrants.

Keywords: Urban nature; Mental health; Migrants

209. Understanding Migrant Population's Settlement Intentions in Urban China: The Role of Social Inclusion

Authors: Yanru Feng, Peicheng Wang, Jiming Zhu, Chenggang Zhang

Abstract: Enhancing the migrant population's intentions to settle in cities is essential for advancing China's new-type urbanisation and population urbanisation strategies. While various studies have established that social inclusion and settlement intentions of Chinese migrants have a close association, existing measurements of social inclusion often focus on a single dimension or rely on limited indicators only. To address this research gap, this study develops a multidimensional measure of social inclusion encompassing both economic and social dimensions, comprising eight indicators. Drawing on data from 96,230 participants in the 2018 China Migrants Dynamic Survey (CMDS 2018), the current study employed logistic regression and latent class analysis (LCA) to examine the relationship between social inclusion and settlement intentions. Logistic regression results demonstrated that total monthly household expenditure, total monthly household income, income from the previous month, establishment of resident health records, and urban-related medical insurance may contribute to increasing the intentions to settle in cities of migrants. Further results indicated that the migrant population employed in both high-prestige (e.g. public servants) and low-prestige (e.g. construction workers) occupations exhibited stronger settlement intentions than those engaged in business. The LCA results classified the migrant population's social inclusion into three levels: low (46.4%), medium (42.8%), and high (10.8%). The study found that a higher level of social inclusion (OR=1.42, 95%CI: 1.32-1.52, $p < 0.001$) was positively correlated with a higher settlement intention among migrants. Taken together, these results suggest a role for social inclusion, especially total monthly household income, establishment of resident health records, and urban-related medical insurance, in promoting willingness to settle in urban areas which may contribute to the formulation of targeted policies aimed at enhancing the settlement intentions of migrants.

Keywords: Settlement intensions; Social inclusion; Migrant population; China

Session 21 Demography and migration

210. Natural Disasters and Migrant Population's Settlement Intentions: The Moderating Role of Social Inclusion

Authors: Peicheng Wang, Yanru Feng, Puyue Gong, Jiming Zhu

Abstract: Natural disasters significantly affect the settlement intentions of China's migrant population, potentially hindering national initiatives such as the new-type urbanization policy. However, existing literature has paid limited attention to this issue. Moreover, it remains unclear whether social inclusion can mitigate the negative impact of disaster exposure on migrants' long-term settlement intentions. This study aims to explore the influence of natural disaster exposure on migrants' willingness to settle in their destination cities and determine the moderating role of social inclusion. Drawing on data from the 2018 China Migrants Dynamic Survey—a nationally representative sample of 84,322 migrants—this research operationalized settlement intention as an outcome, and measured disaster exposure by the frequency of natural disasters in each respondent's migrant province or city. This research employed multivariable logistic regression models to estimate: (1) the direct effect of disaster frequency on settlement intention, and (2) the interaction between disaster exposure and social inclusion, controlling for demographic and socioeconomic factors. The results showed that greater disaster frequency was significantly associated with reduced odds of intending to settle (OR = 0.85, 95% CI: 0.81–0.89, $p < 0.001$). In addition, social inclusion emerged as a significant moderator: migrants with higher levels of social inclusion experienced a substantially attenuated negative effect of disaster exposure on settlement intention (interaction OR = 1.20, 95% CI: 1.04–1.39, $p = 0.014$). These findings suggest that fostering social inclusion—through initiatives that enhance migrants' economic inclusion and public health service—can bolster resilience against the destabilizing impact of natural disasters and support migrants' decisions to remain in urban destinations. Policymakers should prioritize inclusive practices as a key strategy for sustaining migrant communities in disaster-prone areas.

Keywords: Natural disasters; Migrant population; Settlement intentions; Social inclusion

212. The EU Rural Development Policy and Integration of Migrants

Authors: Gönül Oguz

Abstract: Due to recent political crisis and wars in Ukrain and the Middle East, the European Union (EU) is facing a significant increase in the number of migrants arriving at its borders. According to the Eurostat data in 2024, more than half of migrants lived in a predominantly rural regions. This was particularly the case in Ireland (56.8%) and Slovenia (where a peak of 57.9% was recorded). Although migration is predominantly an urban phenomenon, there are not sufficient opportunities available within the framework of rural development policy to assist local rural communities with this new situation. Conversely, the challenges facing rural Europe is delivering both EU-wide and local solutions in a coherent manner, as it is is lacking a support framework in terms of local organisations, the availability of language courses and translation services, coupled with a perceived limited experience of integrating migrants. To this may be added a perception of social isolation of migrants due to the absence of a "social networ" comparable to that of their counterparts living in urban areas. A principal challenge faced by EU policymakers is to scrutinise any new laws to ensure that they take account of the considerable geographical diversity within the EU. This paper critically evaluates the EU's rural development policy to figure out its potential for promoting sustainable development (i.e., job creation) thereby improving the overall quality of life experienced by migrants. Addressing key challenges facing the EU's rural areas, the paper provides some policy guidance for integrating migrants in its regions.

Keywords: European union; Integration; Migration; Rural development policy

8. Resilience Governance in Old and Dilapidated Communities From the Perspective of Risk Inequality: Obstacles, Approaches and Strategies

Authors: Jian Song, Yuefang Rong, Haoxi Lin, Mengyuan Jia

Abstract: Objective: Against the backdrop of increasingly complex societal risks, old communities have become weak links in urban resilience governance due to aging infrastructure, fractured social capital, and imbalanced risk allocation. Existing research focuses on the impacts of external shocks such as natural disasters and public emergencies, exploring pathways to enhance resilience through technical retrofitting and spatial renewal. However, limited attention has been paid to the disparities in adaptive capacity among different groups. Therefore, reconceptualizing the theoretical framework and practical pathways for resilience governance in old communities through the lens of risk inequality has emerged as a critical issue for advancing urban governance modernization and sustainable development.

Methods: This study employs comparative analysis, inductive-deductive reasoning, and literature review to delineate the fundamental connotations and manifestations of risk inequality, and further synthesizes four key dimensions of resilience governance in old communities which are space, society, institution, and technology.

Results: The study reveals that risk inequality is not accidental or unidimensional but arises from the long-term interplay of socioeconomic and environmental factors, undermining the overall resilience and sustainability of old communities. Key obstacles include spatial resource mismatched, ineffective governance capacities, fragmented governance models, and misaligned technological interventions. Based on the concept of lifecycle governance, the basic idea of resilience governance for old communities has been constructed, which includes identification of subject needs, assessment of disaster response space, simulation of disaster processes, and collaborative governance.

Conclusion: Resilience governance in old communities must integrate the principle of spatial justice. By precisely identifying vulnerability patterns, optimizing disaster-responsive spatial layouts, dynamically simulating risk scenarios, and fostering collaborative governance networks, this approach challenges conventional practices, which advocates a paradigm shift in resilience theory from "sustainable development " to "social equity".

Keywords: Risk inequality; Old and dilapidated communities; Resilience governance; Response strategies; Analytical framework

72. Quantifying Flood Resilience in England: The Challenge of Data Availability and Scale

Authors: Anna Goodden, Francesca Vantaggiato, James Porter

Abstract: Climate change challenges current approaches to managing flood risk; the past few years have seen increasingly frequent and severe flood events within Europe and beyond. This has led to an emergence of 'resilience' (the capacity of people to plan, protect, respond and recover) as a new policy focus for flood risk management in England. A key aspect of building resilience is the Environment Agency's (EA) project to develop social and flood resilience indicators to quantify the state of flood resilience in England. At present, the data and shapefiles exist for the individual indicators, yet have not been combined into a composite index for use by policymakers. Moreover, there is uncertainty about which spatial scale resilience should be measured on, to capture both community resilience and national data on if England is becoming more resilient.

Therefore, this research presents a spatial analysis of flood resilience in England across three different scales: Regions, Local Authority Districts (LADs), and Lower Super Output Areas (LSOAs). Principal Components Analysis and GIS were used to combine the EA indicators into a weighted index, to show how current data government availability impacts where is identified as 'resilient' across scales. Overall, the results found significant issues of data availability. All 37 indicators are available on a national scale, yet only 22 are available on a LAD scale, and 13 on a LSOA scale. The flood-specific indicators decreased in availability the most, with only 2/14 available on a LSOA scale. This significant gap in data availability changed the resilience scores and weightings across each scale, showing a gap in actionable data representing resilience on a local scale. Therefore, this research calls for increased collaboration between policymakers and local communities, to improve processes of collecting and sharing data to advance accurate data-driven predictions of resilience in England.

Keywords: Resilience; Public policy; Data availability

138. Testing the Effect of Agricultural Subsidy Policy in the Context of Food Security: Taking the Reform of the Corn Purchase and Storage System as an Example

Authors: Ziduan Zheng

Abstract: Against the backdrop of a rapidly evolving global polycrisis, cities and their affiliated agricultural regions are increasingly confronted with systemic challenges—including climate shocks, population pressures,constrained arable land,and pressing food security concerns.As a critical component of broader urban resilience, agricultural resilience must be bolstered through institutional innovation and rigorous policy evaluation.In particular, amid the ongoing expansion of smart city governance and data-driven public policymaking, examining the reform of corn collection and storage system,as the "highlight" of China's agricultural subsidy policy,offers vital insights into its effects on the urban–agricultural nexus and holds great significance to ensure national food security.Based on the panel data of prefecture-level cities involved in 20 major corn producing areas in China from 2010 to 2022, this paper constructs a double-difference model to empirically test the effectiveness and mechanism of agricultural subsidy policies taking the reform of corn purchase and storage system as an example.The results showed that: 1.the change of corn purchase and storage system to producer subsidy system significantly promoted the increase of corn sown area and total output, and this conclusion was still valid after a series of robustness tests.2.Heterogeneity analysis showed that in non-poverty-stricken counties with higher specialization and better economic development level, the reform of corn collection and storage system could significantly promote the increase of corn sown area and corn yield.3.Improving the land yield rate and the planting income of corn producers are the main mechanisms for the reform of the corn purchase and storage system to significantly promote the increase of corn sown area and corn yield.This study evaluates the performance of agricultural subsidy reform from the standpoint of urban agricultural units, underscoring how institutional innovation can bolster agricultural resilience and resource allocation efficiency. It also provides crucial policy insights for reinforcing food security governance in complex urban systems.

Keywords: Food security; Reform of the purchasing and storage system; Maize planting; Did model

145. Introducing Dynamic Temporal Factors Into the Life Cycle Assessment of Community Energy Systems: A Case Study of a Campus in Cold Regions of China

Authors: Yiting Wang, Yacine Rezgui, Tianyi Zhao

Abstract: In the context of climate change, the global energy transition is urgently needed. Community energy systems with renewable energy sources, as a crucial part of urban energy infrastructure, play a vital role in enhancing energy security and climate resilience. However, current environmental assessments of community energy systems predominantly focus on carbon emissions during the operation phase, neglecting the comprehensive environmental impacts and time-variant characteristics across the entire life cycle, from raw material acquisition, construction, operation to disposal. This oversight may lead to an underestimation of the environmental risks associated with energy systems. This paper innovatively proposes a dynamic life cycle assessment (LCA) method for community energy systems that incorporates time-variant factors. First, a life cycle assessment model covering key energy system components and their entire life cycle is established. Second, a power and heat demand forecasting method based on the CNN-LSTM-Attention algorithm is introduced, integrating the Attention mechanism and CNN module into the LSTM algorithm to improve prediction accuracy. Finally, considering dynamic factors such as future energy mix and equipment performance degradation, a dynamic life cycle environmental impact assessment of the community energy system is conducted. Taking a university energy system in the cold regions of China as a case study, the environmental impact differences between the dynamic LCA method and the traditional LCA method are compared. The results show that the differences can reach up to 20%, with the most significant variations occurring during the operation phase.

Keywords: Dynamic life cycle assessment (DLCA); Community energy system; Climate resilience; Energy consumption prediction

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191. Insights on Local Officials and Public Participation in Urban Planning: Evidence from Chinese Cities

Authors: Xu Haiyun, Meng, Miao, Zhu, Fangyu, Ding, Qi

Abstract: Even though the importance of public participation in urban planning has been thoroughly discussed in European and North American planning circles, it is still a new topic in China. Top-down planning processes are dominant in China, yet local officials are empowered to determine the extent and nature of public participation during local planning processes. To date, few scholars have explored how local decision-makers use this authority or which elements factor into the strategies they choose. Our analysis of master plans from 129 of China's county-level cities shows that the age, overseas education experiences, and professional experiences of local officials have a significant effect on their decisions related to promoting public participation during the planning process, while their education level, Party school experience, and political career experience do not. We conclude that older-age local officials with overseas study experience, or with a background in technology or academia, tend to have a greater interest in promoting public participation in the process of crafting local master plans. We finally conclude with three insights that aim to enhance public participation in urban planning and land use management policy making: (1) Increased international communications and specific empirical case studies of public participation for officials; (2) Standardization of public participation in the planning and management processes; and (3) Utilization of more user-friendly online resources to expand public involvement and highlight the potential benefits for officials.

Keywords: Public participation, urban planning, master plan, local officials, urban governance

207. Navigating Complexity: Building Urban Resilience Through Systems Thinking in the Age of Compounding Risks

Authors: Leila Irajifar

Abstract: Urban populations are rapidly expanding, often in hazard-prone regions, exposing communities to increasingly frequent and compounding disasters. In Australia and globally, climate change, social inequality, and infrastructure vulnerabilities converge to intensify the risk for marginalized urban populations. These communities, often residing in informal settlements or under-resourced areas, face disproportionate impacts from hazards such as heatwaves, floods, bushfires, and pandemics.

This paper draws on the WP1 report from the "Natural Hazards and Resilience in Complex Urban Systems" project to argue that cities must be understood as complex adaptive systems (CAS). In this framing, urban vulnerabilities are not merely outcomes of isolated hazards but emerge from dynamic interdependencies among infrastructure, governance, social networks, and the environment. Events like a cyclone or a pandemic reveal how shocks cascade through urban systems, disproportionately affecting those with the least capacity to adapt or recover.

Systems thinking offers powerful tools to understand and manage these risks. By mapping feedback loops and identifying systemic leverage points, it becomes possible to design interventions that build resilience across multiple domains simultaneously. Approaches such as participatory mapping, scenario planning, and anticipatory action planning—tailored to local contexts—are especially promising.

To enhance urban resilience for the most vulnerable, we recommend: embedding systems thinking into governance and planning; addressing multi-hazard risks; co-producing solutions with communities; investing in anticipatory actions; and building inclusive, cross-sector coordination. These strategies help move beyond reactive responses toward proactive, equitable, and adaptive resilience-building.

Ultimately, embracing complexity is not a barrier—it is a pathway to ensure that resilience efforts reach those who need them most, transforming fragmented disaster management into inclusive, systemic change.

Keywords: Complex systems; Urban resilience; Compounding risk

12. How Visual Green Exposure Promotes Urban Park Engagement: A Causal Analysis Using Mobility Data and Park Panoramas

Authors: Yichun Zhou

Abstract: Urban green spaces are vital components of city landscapes, with extensive greenery enhancing urban residents' enjoyment and connection to nature. Yet most evidence on the influence of visible greenery remains correlational and static, limiting our understanding of both causal mechanisms and spatiotemporal heterogeneity. This study addresses these gaps by integrating large-scale mobility data with panoramic park imagery from Tokyo's 23 special wards to examine how visual green exposure (VGE) affects park engagement. Using propensity score matching (PSM), the analysis reveals that higher VGE (>30%) significantly increases both visitors' stay duration (+3.36 minutes) and walking distance (+116.95 meters). Spatially, high VGE boosts engagement in city-center parks but reduces walking distance in peri-urban areas, suggesting that local context shapes greenery's impact. Temporally, stronger positive effects emerge on weekends and during morning or midday hours, while engagement declines in the evening. Seasonally, all seasons except winter show notable gains in engagement, with heightened physical activity in spring and fall. These findings underscore the importance of context-specific strategies, such as targeted canopy placement, density management, and adaptive maintenance schedules, to encourage park engagement. By providing clear causal evidence, this study offers actionable guidance for planners and policymakers seeking to enhance public interaction with nature in increasingly dense urban settings.

Keywords: Urban green space; Park visitation; Green exposure; Causal inference; Propensity score matching

27. Optimization of Urban Greenspace Using AI for SUHI Mitigation: Prospects of Dhaka City, Bangladesh

Authors: Musarrat Zaman, Yuan Shi

Abstract: This study will discuss the plausible optimisation of urban green spaces using Artificial Intelligence (AI) for the Surface Urban Heat Island (SUHI) mitigation of Dhaka city. Dhaka is one of the densely built urban areas infiltrated with numerous environmental hazards and climate change impacts turning into a poly-crisis situation. UHI is one of the major crises in Dhaka, due to the global temperature rise, densely built concrete structures, myriad traffic and the lack of green spaces in the city. The existing green spaces and wetlands are being shrunk exponentially to accommodate its gigantic number of residents which also exacerbates the SUHI effects. This deteriorates public health and threatens the sustainability of the city. In this context, the optimisation of green spaces using Green Infrastructure (GI) strategies, such as green roofs, green walls, pocket parks etc. can play an effective role in the study area to cool it down within its highly concentrated structures and limited open spaces. This study will use spatial analysis techniques using Remote-Sensing & GIS and Machine Learning algorithms such as Convolutional Neural Networks (CNN) to identify the SUHI hotspots from the Local Climatic Zones (LCZ) classes and to predict the suitable GI interventions in those target areas analysing the Land Surface Temperature (LST). Then the model will be trained with evolutionary genetic algorithms to get the best cooling effect and the least space requirement. The historical data of satellite images and the latest dataset of the LCZs of the study area will be collected from open sources. This study will produce GIS-based hotspot maps followed by machine learning estimation of the most feasible installation of GI techniques which will play a vital role in further simulations of various GI impacts on SUHI mitigation in Dhaka and assist in developing advanced strategies for climate change adaptation.

Keywords: Polycrisis; Surface urban heat island (SUHI); Green infrastructure; Machine learning

42. How Grey-Green Spatial Morphology of Neighborhood Block Shapes Urban Heat and Air Pollution Islands

Authors: Keyu Luo, Weifeng Li

Abstract: Cities globally confront escalating environmental challenges from compounded air pollution and heatwaves, with the Huabei Plain in China emerging as a critical hotspot due to its rapid urbanization, dense population, and climatic vulnerability. This region exemplifies the socio-environmental risks of overlapping air pollution islands (API) and urban heat islands (UHI). Despite growing recognition of these risks, gaps persist in understanding how urban gray-green landscapes—comprising built infrastructure and natural elements—modulate the spatiotemporal dynamics of compound exposure. Addressing this knowledge gap is vital for designing resilient cities that balance developmental needs with environmental equity.

This study integrates urban landscape geography, environmental epidemiology, and spatial econometrics to unravel the mechanisms linking gray-green patterns to API-UHI interactions. We used high-resolution air quality monitoring (PM_2.5) and satellite-derived land surface temperature (LST), providing a holistic metric for coupled risks. Next, the gray-green landscape is quantified through multidimensional descriptors: geometric complexity (shape index, edge density), vertical structure (canopy height, building height), and functional connectivity (green corridor continuity). A spatial-lagged structural equation model (SL-SEM) is developed to dissect the nonlinear pathways through which landscape configurations drive exposure disparities.

Key findings reveal that clustered high-rise developments amplify nocturnal heat retention and trap PM_2.5 by reducing ventilation efficiency, whereas interconnected canopy coverage yield co-benefits, lowering daytime heat stress and PM_2.5 through enhanced evapotranspiration and aerodynamic dispersion. The SL-SEM framework demonstrates superior explanatory power, capturing latent interactions such as how green spaces in upwind zones mitigate downwind pollution.

By quantifying trade-offs between vertical densification and horizontal green connectivity, it offers actionable pathways in enhancing thermal-comfort corridors and pollution buffer zones—prioritizing shaded walkways, pollution-filtering green belts. Methodologically, it advances urban environmental geography by establishing a spatially explicit decision-support paradigm for compound risk governance in rapidly urbanizing regions.

Keywords: Optimization of Urban Greenspace Using AI for SUHI Mitigation: Prospects of Dhaka City, Bangladesh

84. Impacts of Land Surface Temperature and Ambient Factors on Near-Surface Air Temperature Estimation: A Multisource and Multiscale Evaluation

Authors: Songyang Li, Man Sing Wong, Rui Zhu, Guoqiang Shi

Abstract: The urban heat island (UHI) effect, characterized by elevated temperatures in cities compared to surrounding rural areas, has emerged as a critical environmental challenge exacerbated by climate change and rapid urbanization. UHI intensifies energy consumption, heat-related health risks, and ecological imbalances, compounding the vulnerabilities of urban populations to risks such as global warming. As cities continue to expand globally, understanding the dynamics of near-surface air temperature (Ta), a vital indicator for urban thermal environment evaluation, is essential for understanding UHI impacts and enhancing climate resilience. Machine learning (ML) models are widely utilized for Ta estimation. Yet, systematic investigation on how multisource physical and anthropogenic factors distinctly influence daytime and nighttime Ta across heterogeneous environments remains limited. To this end, geospatial datasets incorporating MODIS-derived land surface temperature and 29 ancillary factors were employed to estimate Ta from 292 stations in China using ML modeling (training: 2017–2020). The optimal LightGBM-based models outperformed and obtained testing RMSEs of 3.03 °C (daytime) and 2.64 °C (nighttime) in 2021. Spatial analysis revealed distinct patterns, including coastal regions exhibiting enhanced daytime accuracy, while northern mid-temperate zones showed higher nighttime uncertainty. Comprehensive and individual models-based SHapley Additive exPlanations (SHAP) interpretation underscores the importance of incorporating macroscale meteorological backgrounds and terrain-related features for Ta estimation improvement, as well as the critical impact of local urban morphology and anthropogenic indicators. This study has the potential to provide actionable insights for optimizing variable selection in ML-based Ta estimation and future UHI mitigation-oriented city planning within specific regional and local climatical contexts. Further explorations towards city local regions are also being conducted in case cities to evaluate the findings across scales.

Keywords: Near-surface air temperature; Lst; Machine learning; Influential factor; Shap

Session 23 Urban Green Space

96. Spatiotemporal Shifts of Plant Phenology and Their Climatic Drivers in Subtropical Urban Areas: A Case Study of Hong Kong

Authors: Run Li

Abstract: Plant phenology refers to the natural phenomena that recur periodically in plant life cycle, such as budburst, flowering, fruiting and leaf senescence, and plays a crucial role in regulating ecosystem processes, functions and services. Climate is the predominant factor regulating plant phenology, with global warming triggering distinct phenology shifts. In urban areas, Phenology shifts are further exacerbated by urban environmental characteristics such as the urban heat island effect, consequently exerting profound effects on urban ecology, climate system, public health, and economy. Monitoring, understanding, and predicting phenology shifts are essential for revealing the response mechanisms of urban ecosystems to climate change, providing a scientific basis for urban ecological management and sustainable planning.

Current research on plant phenology mainly focuses on temperate and high-latitude regions, while investigations into subtropical urban plant phenology and its response to climate change remain relatively scarce. This study takes Hong Kong as a case study, using the spatial and temporal adaptive reflectance fusion model (STARFM) to integrate Landsat and MODIS remote sensing data, thereby constructing a long-term dataset of normalized difference vegetation index (NDVI) with high spatiotemporal resolution. The dynamic threshold methods are employed to extract phenology indicators such as the start of growing season (SOS), end of growing season (EOS) and length of growing season (LOS) in order to analyze the spatiotemporal patterns and trends of plant phenology in subtropical urban areas. Combined with meteorological data, This study conducts correlation analysis between phenology indicators and climatic parameters to identify the key climatic drivers of phenology shifts. The research findings will provide data support and scientific guidance for ecological conservation and resilience enhancement in subtropical cities, supporting the formulation of climate change adaptation policies for subtropical urban areas and contributing to sustainable urban development.

Keywords: Phenology

190. Possibilities of Greener Cities: Advancing a 3D Approach

Authors: Shoubang Huang, Kai Zhou, Shiyang Zhang, Xiangrong Wang

Abstract: Rapid urbanization and urban densification have intensified the demand for equitable and sustainable acquisition of Urban Green Space (UGS). Traditional studies on UGS exposure and equity have primarily relied on 2D indicators such as Green Coverage Ratio (GCR), which are insufficient to fully capture the spatial complexity of UGS. In this study, we developed a 3D Green Quantity (3DGQ) assessment method based on multi-source remote sensing satellite data and machine learning algorithms. We proposed a new indicator, the 3D Green Coverage Ratio (3DGCR), and applied it to the central area of Beijing, conducting mapping and comparative analysis of both 2D and 3D green quantities. The results reveal that the spatial pattern of 3DGQ exhibits a “low-south, high-north” characteristic, which is significantly different from the 2D pattern of “low-center, high-periphery.” Moreover, the equity of 3D green exposure, as measured by the Gini coefficient (0.64), is significantly lower than that of the 2D measure (0.36), indicating that traditional indicators may underestimate the risk of unequal green resource allocation. This study not only highlights the importance of introducing a 3D perspective in UGS management but also further reveals the potential of dense urban areas to enhance UGS quantity and improve equity, providing new insights for future UGS optimization and sustainable development.

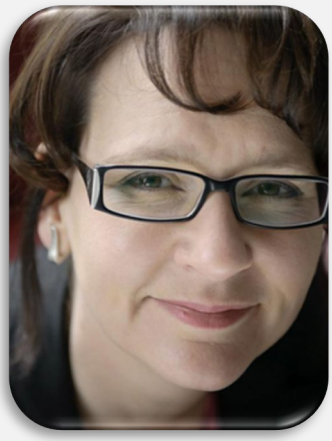
Keywords: 3D Green quatity; Urban green space; Green space exposure; Equity; Landscape assessment

5. Participants

This part introduces the information about Keynote Speakers, Scientific Committee, Local Committee, City+ Committee, Volunteers, Technical Staff, Presenters and Descriptive Statistics.

5.1. Keynote Speakers (in the order of appearance)

- **Prof. Melinda Mills**, Leverhulme Centre for Demographic Science, University of Oxford, The United Kingdom
- **Prof. Tim Schwanen**, Transport Studies Unit, School of Geography and the Environment, University of Oxford, The United Kingdom
- **Prof. Danny Dorling**, School of Geography and the Environment, University of Oxford, The United Kingdom
- **Prof. Zhifu Mi**, The Bartlett School of Sustainable Construction, University College London, The United Kingdom
- **Prof. Thanasis Kizos**, Department of Geography, University of the Aegean, Greece
- **Prof. Charles Rahal**, Leverhulme Centre for Demographic Science, University of Oxford, The United Kingdom
- **Dr. Douglas Leasure**, Leverhulme Centre for Demographic Science, University of Oxford, The United Kingdom
- **Dr. Daniel Valdenegro**, Leverhulme Centre for Demographic Science, University of Oxford, The United Kingdom
- **Dr. Zahratu Shabrina**, Spatial Data Science, King's College London

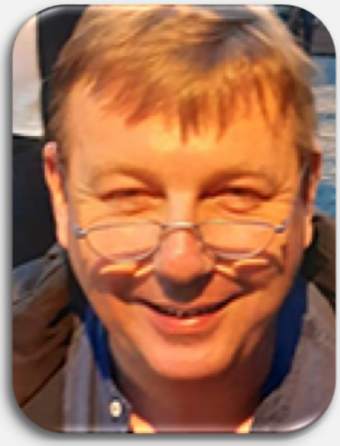


Prof. Melinda Mills
University of Oxford

Nuffield Professor of Demography, director of Leverhulme Centre for Demographic Science, Fellow of the Academy of Social Sciences, and Fellow of the British Academy. Her research spans diverse interdisciplinary topics in biodemography, empirical sociology, statistics, public health and molecular genetics.

Prof. Tim Schwanen
University of Oxford

Professor of Transport Geography, director of Transport Studies Unit at School of Geography and the Environment, Fellow of the Academy for Social Sciences. Tim's research concentrates on the geographies of the everyday mobilities of people, goods and information.



Prof. Danny Dorling
University of Oxford

'1971 Professorship of Geography', Fellow of Royal Society of Arts, Fellow of the Academy of Social Sciences, Fellow of Royal Statistical Society and Fellow of Royal Geographical Society. He has authored a substantial number of papers and books on issues of housing, health, employment, education, and poverty.

Prof. Zhifu Mi
University College London

Professor of Climate Change Economics. He researches the economics of climate change, aiming to identify the most cost-effective and equitable steps to take to mitigate climate change. He has published extensively in leading journals such as Lancet and Nature sustainability.

Prof. Thanasis Kizos
University of the Aegean

Professor in rural Geography and head of the Department of Geography. He has published in agricultural landscape change, land use planning, agroforestry, sustainable agriculture, biodiversity impacts of agricultural systems among other topics.

Dr. Charles Rahal
University of Oxford

Associate Professor in Data Science and Informatics. Charles is particularly interested in 1) methodology; specifically model uncertainty, responsible research, machine and deep learning related to health and social science; 2) applied Data Science; 'unstructured data' found 'in the wild'; and 3) scientometrics; data analysis of the scientific record at scale.

Dr. Douglas Leasure
University of Oxford

Senior Researcher and Data Scientist. He specialises in developing novel methods to map population sizes and demographics with high spatial resolution in data-sparse settings.

Dr. Daniel Valdenegro
University of Oxford

Senior Data Scientist and Postdoctoral Researcher in Computational Social Science. His research in the Centre is focused on the development of robust estimation methods for social science and in the development of software libraries in Python and R to perform multiverse-type estimations.

Dr. Zahratu Shabrina
King's College London

Zara's research is methodologically grounded in the use of artificial intelligence and urban data science. She has employed a range of approaches, including machine/deep learning, natural language processing, geographically weighted regression, spatial interaction and general spatio-temporal models, to address critical urban challenges.

5.2. Scientific Committee (in the order of last name)

- **Nan Bai,** Assistant Professor, Department of Architectural Engineering and Technology, Delft University of Technology, The Netherlands
- **Manos Chaniotakis,** Associate Professor, The Bartlett School of Environment, Energy & Resources, University College London, The United Kingdom
- **Harry Charrington,** Professor, School of Architecture and Cities, University of Westminster, The United Kingdom
- **D'Maris Coffman,** Professor, The Bartlett School of Sustainable Construction, University College London, The United Kingdom
- **Ashraf Dewan,** Associate Professor, School of Earth & Planetary Sciences, Curtin University, Australia
- **Weijun Gao,** Professor, Faculty of Environmental Engineering, University of Kitakyushu, Japan
- **Haoying Han,** Professor, Faculty of Innovation and Design, City University of Macau, Macau SAR, China
- **Abolfazl Karimpour,** Assistant Professor, College of Engineering, State University of New York Polytechnic Institute, The United States
- **Ying Long,** Professor, School of Architecture, Tsinghua University, China
- **Liang Ma,** Research Professor, College of Urban and Environmental Sciences, Peking University, China
- **Xiaobo Ma,** Data Scientist, Pima Association of Governments, The United States
- **Nasser Najibi,** Assistant Professor, Department of Agricultural and Biological Engineering, University of Florida, The United States
- **Fu Ren,** Professor, School of Resources and Environmental Sciences, Wuhan University, China
- **Zahratu Shabrina,** Senior Lecturer, Department of Geography, King's College London, The United Kingdom

5.2. Scientific Committee (in the order of last name)

- **Zhenfeng Shao,** Professor, The National Key Laboratory of Surveying, Mapping and Remote Sensing Information Engineering, Wuhan University, China
- **Yongze Song,** Senior Lecturer, School of Design and the Built Environment, Curtin University, Australia
- **Li Wan,** Associate Professor, Department of Land Economy, University of Cambridge, The United Kingdom
- **Jiayu Wu,** Professor, College of Agriculture and Biotechnology, Zhejiang University, China
- **Weiwen Zhang,** Professor, School of Public Affairs, Zhejiang University, China
- **Pengyu Zhu,** Professor, Division of Public Policy, Hong Kong University of Science and technology, Hongkong SAR, China
- **Motti Zohar,** Senior Lecturer, School of Environmental Sciences, University of Haifa, Israel

5.3. Local Committee (in the order of last name)

- **Tim Schwanen (Honorary chair),** University of Oxford, The United Kingdom
- **Xiang Ao (Chair),** University of Oxford, The United Kingdom
- **Nicholas Chow,** University of Oxford, The United Kingdom
- **Dasom Hong,** University of Oxford, The United Kingdom
- **Min Ruan,** University of Oxford, The United Kingdom
- **Qianwen Li,** KU Leuven, Belgium

5.4. City+ Committee (in the order of last name)

- **Yongping Zhang (Chair),** Zhejiang University, China
- **Mengqiu Cao (Co-chair),** University College London, The United Kingdom
- **Zhifu Mi (Co-chair),** University College London, The United Kingdom
- **Tianren Yang (Co-chair),** University of Hong Kong, Hong Kong, China
- **Lorenzo Ceccon,** Polytechnic University of Milan, Italy
- **Frank Chuang,** Chengchi University, Chinese Taipei
- **Mingjie Dai,** City University of Macau, Macau, China
- **Yiru Jia,** Beijing Forestry University, China
- **Yang Liang,** Guilin University Of Electronic Technology, China
- **Zhicheng Liu,** University College London, The United Kingdom
- **Annalisa Rollandi,** Polytechnic University of Milan, Italy
- **Fred C. Sanders,** Delft University of Technology, The Netherlands
- **Yang Song,** King's College London, The United Kingdom
- **Yongze Song,** Curtin University, Australia
- **Haiyun Xu,** Beijing University of Civil Engineering and Architecture, China
- **Juan Yan,** Tongji University, China
- **Huajie Yang,** City University of Macau, Macau, China
- **Peiheng Yu,** Chinese Academy of Sciences, China
- **Pengcheng Zeng,** Polytechnic University of Milan, Italy
- **Qinfeng Zhao,** Architectural Design and Research Institute of Zhejiang University, China
- **Tuyu Zhou,** SGS Economic & Planning, Australia

5.5. **Volunteers** (in the order of last name)

- **Sangwon Chae,** University of Oxford, The United Kingdom
- **Lena Easton-Calabria,** University of Oxford, The United Kingdom
- **Pan Ei Ei Phyoe,** University of Oxford, The United Kingdom
- **Wenyan Fu,** Zhejiang University, China
- **Thomas Hancock,** University of Leeds, The United Kingdom
- **Vrinda Jariwala,** University of Oxford, The United Kingdom
- **Nethmi Jayaratne Kariyawasam,** University of Oxford, The United Kingdom
- **Sieun Lee,** University of Oxford, The United Kingdom
- **Yi Fan Liu,** University of Oxford, The United Kingdom
- **Junior Mbangala,** University of Oxford, The United Kingdom
- **Bikem Pastine,** University of Oxford, The United Kingdom
- **Camila Ramos,** University of Oxford, The United Kingdom
- **Junjie Shi,** Zhejiang University, China
- **Yue Yin,** University of Oxford, The United Kingdom
- **Shan Yu,** University of Oxford, The United Kingdom
- **Yan Yu,** University of Oxford, The United Kingdom
- **Wenlan Zhang,** University College London, The United Kingdom
- **Zhaoqi Zhou,** University of Oxford, The United Kingdom

5.6. Technical Staff

- **Photographer:** Brandon Neo is a photographer from Singapore with over 8 years of experience in corporate, event, and studio photography. For more of his work, please visit https://www.brandonvisuals.com

- **First aider:** Alice Jardine, University of Oxford, The United Kingdom

5.7. Presenters

- Aditya Sarkar, Tufts University/World Bank
- Akos Balog, University of Liverpool
- Alejandra Duarte Montes, University of Valladolid
- Alejandro Moreno Jimenez, University of York
- Amay Arora, The George Washington University
- Anbang Xie, Tsinghua University
- Andrea Costa-Allendes, University College London (UCL)
- Anna Goodden, King's College London
- Antoinette Louise Makani, Cardiff University
- Aubrey Steingraber, Southampton University
- Ben Hao, Zhengzhou University
- Ben Jiang, Dalian University of Technology
- Bingzhi Liu, Chinese Academy of Science
- Bohao Su, University College London
- Camila Ramos, University of Oxford
- Cansu Çiçek Aydin, Istanbul Technical University (ITU)
- Charles Josefson, King's College London
- Chen Cui, Newcastle University
- CHEN LI, Zhejiang University
- Chengcheng Liu, Peking University/ University of Cambridge
- Chengwei Li, NYU Shanghai and ECNU
- Chunli Zhao, Lund University
- Congyue Zhou, School of Architecture and Urban PlanningHuazhong
- Efstratia (Efi), Unicersity of the Aegean
- ENES AYDIN, The University of Sheffield
- Fauziah R. Yuniarti, Durham University, UK
- Feifeng Jiang, Hong Kong Baptist University
- Feng Chen, Beijing institute of technology
- Francesco Guglielmi, Politecnico di Milano
- Francesco Viviani, University of Florence

5.7. Presenters

- Gönül Oguz, Giresun University
- Haiyun Xu, Beijing University of Civil Engineering and Architecture
- Han Mu, Hohai University
- Hansha Kistamah, Kobe University
- Hao Zhang, University of Cambridge
- hengxu jin, Technical University of Berlin
- Houwei Fu, University College London
- HU JINJING, Tongji Univeristy
- Huan Zhou, University of Maryland
- Huang Qin Ya, Chongqing university
- HUANG Yujin, City University of Hong Kong
- Huanjie Liu, Tianjin University
- Humaid Alrashdi, Zhejiang University
- Janus Leonhardt, Pontificia Universidad Católica de Chile
- Jaya Yadav, Department of English, University of Delhi
- Jiajia Wang, University of Illinois Urbana-Champaign
- Jian Li, Tongji University
- JIAN WANG, Nanjing Agricultural University
- Jiaying Li, Cranfield University
- Jiemei Luo, Harbin Institute of Technology (Shenzhen)
- Jin Rui, King's College London
- Jing Zhang, Xi'an Technological University
- Jingjie Zhou, Wuhan University
- Jingjing Cai, Xiamen University
- Jingxiong Huang, Tsinghua University - Politecnico di Torino
- Junior Mbangala, University of Oxford
- Junqing Zhu, Donghua university
- Kaixuan Chen, Shanghai Jiao Tong University
- KEDI HU, Tianjin Chengjian University
- KEYU LUO, The University of Hong Kong

5.7. Presenters

- Kofoworola Modupe Osunkoya, Tallinn University of Technology, Estonia
- Leila Irajifar, RMIT University
- li lyu, East China Jiaotong University
- Li Run, Hong Kong Polytechnic University
- Liang Dong, City University of Hong Kong
- Liangliang Rong, Guangdong Eco-Engineering Polytechnic, The Univers
- Lin Tian, Tongji University
- Lina Waqfi, Toronto Metropolitan University
- Lingyan Li, Shandong University
- Lojine Hanoun, University of Manchester
- Ma Xiaohui, The University of Kitakyushu
- Mengqiu Cao, University College London
- Milena Vukmirovic, University of Belgrade
- Mingjie SHENG, Tianjin University
- Mingqing Yin, University of Barcelona
- Moayad Shammut, Independent Researcher
- Mohammad Anwar Fetrat, University of Glasgow
- Mohammad Sharif, University of Duisburg-Essen
- Musarrat Zaman, University of Liverpool
- Oana Garbasevschi, ifo / DLR
- Peicheng Wang, Tsinghua University
- Pietro Mariano, Politecnico di Milano
- Puyue Gong, Tsinghua University
- Qingyue Xue, University of Exeter
- Quanlong liu, UCL-Bartlett
- RATI SANDEEP CHOUDHARI, University of Manchester
- RUAN, Xiaohang, The Hong Kong Polytechnic University
- Rui Zhou, Southwest Jiaotong University
- Shahana Akther, University of Manchester
- Shan Yu, University of Oxford

5.7. Presenters

- Shengwang Bao, Beijing Normal University
- Shoubang Huang, Beijing Forestry University
- Shuli Luo, The Chinese University of Hong Kong, Shenzhen
- Sofia Zafeirelli, University of the Aegean
- SONG Jian, BUCEA
- Songyang Li, The Hong Kong Polytechnic University
- Thejangunuo Keretsu, Azim Premji University
- THOMAS HANCOCK, University of Leeds and University of Oxford
- tianlian wang, Tianjin university, CN
- Tianrui Sun, Queen's University Belfast
- Wanbo Liu, University of Cambridge
- WANG Maoping, Hong Kong polytechnic University
- Weijia Li, Tianjin University
- Weijie Qiao, The University of Auckland
- Wen Jiang, Chongqing University
- Wensen Luo, Tongji University
- Wenyan Fu, Zhejiang University
- Wu Zihao, Nanjing University
- Xiangyu He, Zhengzhou University
- Xin MA, Waseda University
- Xingchen Lai, The University of Kitakyushu
- Xinwen Zhang, Politecnico di Torino
- Xuanru ZHOU, BEIJING NORMAL UNIVERSITY
- Xuanyan Chen, Wuhan Univ. / Ghent Univ.
- Xueyan Liu, Dalian University of Technology
- Yan Zhang, Nanjing University
- Yang Yang, Zhejiang University
- Yanru Feng, Tsinghua University
- Yanwen Liao, Tsinghua University
- Yiannis Paraskevopoulos, National Technical University of Athens

5.7. Presenters

- Yichun Zhou, New York University Shanghai
- Ying Zheng, Queen's University Belfast
- Yiqing Liu, Tianjin Chengjian University
- Yiting Wang, Dalian University of Technology
- Yixin Wu, National University of Singapore
- Yiying Zhu, University of Kitakyushu
- YU Jinyi, The Hong Kong Polytechnic University
- Yue Li, Chang'an University
- Yueting Ding, Beijing Institute of Technology
- Yuhong Wang, University College London
- Yujing Yang, University of Birmingham
- Yu-Tung Wu, University of Sheffield
- Yuxin Zhang, The University of Kitakyushu
- Zahratu Shabrina, King's College London
- Zakia Sultana, Utrecht University
- Zhang Chen, Shenzhen University
- Zhang Heng, Seoul National University
- Zhang Yuchen, The University of Kitakyushu
- Zhaoqi Zhou, University of Oxford
- Zhaowen Deng, Seoul National University
- Zhenfeng Shao, Wuhan University
- Zhiwu Wei, University of Cambridge
- Zhuhui Bai, Ku Leuven & Peking University
- Ziduan Zheng, Zhengzhou University
- Zining Wang, Hong Kong University of Science and Technology

5.8. Descriptive Statistics

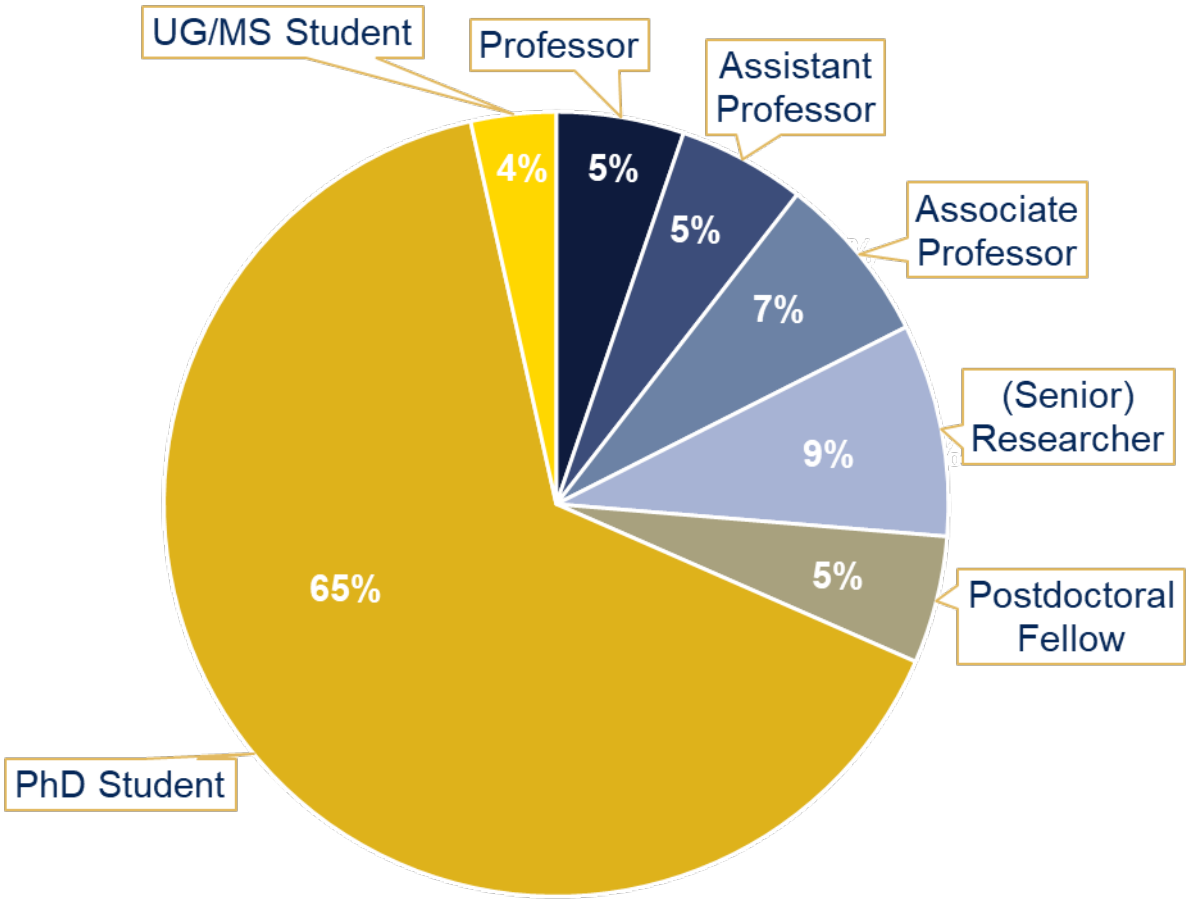
The City+2025@Oxford attracts over 170 scholars and PhD students from ~90 universities and institutes across Asia, Europe, North/South America, and Oceania. Participants come from Australia, Belgium, Canada, Chile, China, Estonia, Germany, Greece, India, Italy, Japan, New Zealand, Serbia, Singapore, South Korea, Spain, Sweden, the United Kingdom, the Netherlands, the United States and Turkey.

Country	Number of participants
Australia	1
Belgium	2
Canada	1
Chile	1
China	57
Hong Kong (China)	12
Macau (China)	1
Estonia	1
Germany	4
Greece	4
India	2
Italy	4
Japan	7
The Netherlands	1
New Zealand	1
Serbia	1
Singapore	2
South Korea	2
Spain	2
Sweden	1
The United Kingdom	55
Turkey	2
The United States	6

Note: Figures in the chart are based on available data and may differ slightly from real ones.

5.8. Descriptive Statistics

In terms of the participant position, PhD students form the majority at 65%. They are followed by (Senior) Researchers (9%) and Associate Professors (7%). Professors, Assistant Professors, and Postdoctoral Fellows each account for 5%, while Undergraduate/Master's students represent 4%.



Note: Figures in the chart are based on available and adjusted data and may differ slightly from real ones.

29th - 30th September 2025
School of Geography and the Environment,
University of Oxford

Urban Data Analytics and the Polycrisis

SoGE School of Geography and the Environment
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AET Association for European Transport
TSU TRANSPORT STUDIES UNIT
MUSA Lab Mobility and Urban Systems Analytics
ELSEVIER