

Haifeng Niu

Research Associate

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APPOINTMENTS

University of Cambridge

Research Associate, Department of Land Economy Jan 2022–Present

- Data Champions, University of Cambridge
- Leading spatial analysis work in European Union’s Horizon 2020-funded project Emotional Cities WP4 (Spatial Analysis for Urban Health)
- Member of EU Urban Health Cluster WG2 (Health determinants and urban interventions)

EDUCATION

University of Cambridge (Cambridge)

PhD in Land Economy Oct 2017–Dec 2021

- Supervisor: Prof. Elisabete A. Silva (MRTPI, FAcSS)
- Thesis: Sensing Urban Dynamics through Crowdsourced Data with the Support of Machine Learning Techniques

Huazhong University of Science and Technology (HUST)

MPhil in Urban and Rural Planning Sep 2014–Jun 2017

Sichuan Agricultural University (SAU)

BSc in Resources Environment & the Management of Urban and Rural Planning Sep 2010–Jun 2014

RESEARCH AREAS

My research interest covers Big Data Mining, Spatial Data Science, GeoAI, Urban Informatics, Smart Cities and Governance. I have a strong interest in how the intersection of Machine Learning & AI and urban big data supports better spatial planning, policy-making and smart governance. My ongoing and future work focus on:

- **Digital Twins, Urban Nowcasting, and Dynamic Simulation Using Big Data**
- **Smart Governance Enhanced by Explainable Machine Learning and GeoAI**
- **Sustainable, Resilient, and Healthy Cities under Complexity Theory**
- **ESG-Driven Research in Urban Spatial Governance**

RESEARCH GRANTS AND PROJECTS

- 2022 European Union's Horizon 2020 project – Emotional Cities (€5000k), Lead Researcher
- 2019 Tsinghua University–Cambridge University Joint Research Initiative Fund (£10k), Named Researcher
- 2018 Centre for Digital Built Britain Mini-projects Programme (£20k), Co-PI
- 2017 UN-Habitat project – Improved Urban Public Spaces in China, Researcher
- 2017 National Natural Science Foundation of China No.51578256 (£90k), Named Researcher

PUBLICATIONS *Corresponding author

Book Chapters

- 2021 Silva, E.A., Liu, L., Kwon, H.R., **Niu, H.**, Chen, Y. and Reis, J. “What’s New in Urban Data Analytics?” In: *Applied Data Analysis for Urban Planning and Management*, edited by Alasdair Rae and Cecilia Wong. England: SAGE.
- 2021 Silva, E.A., Liu, L., Kwon, H.R., **Niu, H.**, Chen, Y. “Hard and Soft Data Integration in Geocomputation: Mixed Methods for Data Collection and Processing in Urban Planning.” In: *Handbook of Planning Support Science*, edited by Stan Geertman and John Stillwell. doi:10.4337/9781788971089.00010

Journal Articles

- 2023 **Niu, H.***, Tu, X. and Silva, E. A. “Using Decision Tree Methodologies to Explore Determinants of Health and Well-Being at the Regional Scale: The Case Study of London.” *Built Environment*, 49(2), 279-297.
- 2023 **Niu, H.*** and Silva, E. A. “Understanding Temporal and Spatial Patterns of Urban Activities Across Demographic Groups Through Geotagged Social Media Data.” *Computers, Environment and Urban Systems*, 100. doi:10.1016/j.compenvurbsys.2022.101934
- 2022 Chen, Y., **Niu, H.***, and Silva, E. A. “The Road to Recovery: Sensing Public Opinion Towards Reopening Measures with Social Media Data in Post-Lockdown Cities.” *Cities*, 104054. doi:10.1016/j.cities.2022.104054
- 2021 **Niu, H.*** and Silva, E. A. “Delineating Urban Functional Use from Points of Interest Data with Neural Network Embedding: A Case Study in Greater London.” *Computers, Environment and Urban Systems*, 88. doi:10.1016/j.compenvurbsys.2021.101651
- 2020 **Niu, H.*** and Silva, E. A. “Crowdsourced Data Mining for Urban Activity: Review of Data Sources, Applications, and Methods.” *Journal of Urban Planning and Development*. doi:10.1061/(ASCE)UP.1943-5444.0000566
- 2017 He, Y., **Niu, H.**, and Deng, W. “Regional Characteristics of Ancient Villages and Townships Under the Influence of External Mechanism.” *City Planning Review*, (10), p.14.
- 2016 He, Y., **Niu, H.**, and Qian, H. “A Research of City Spatial Memory Based on the Event History.” *Urbanism and Architecture*, (16), p.3.

Working Paper

- **Niu, H.***, Seraphima, A. P., Morgado, P., Miranda, B., and Silva, E. A. “Portraying Spatial Patterns of Emotions Across Age and Gender Groups with Geotagged Social Media Data.” *Sustainable Cities and Society*. Under Review.

- Seraphima, A. P., **Niu, H.**, Morgado, P., Miranda, B., and Silva, E. A. “Systematic Review of Spatial Determinants of Urban Health: A Policy-to-Science Approach.” Under Review.
- **Niu, H.*** “Seeing High Streets Through the Lens of GeoAI: Representation Learning of Functionality of Streets Using Points of Interest Data.” Draft in Preparation.
- **Niu, H.***, Silva, E. A. “Exploring Nonlinear Relationships Between Urban Determinants of Health and Wellbeing Outcomes Using Explainable Machine Learning Models.” Draft in Preparation.

CONFERENCE AND INVITED TALKS

Conference Presentation

- 2023 “Exploring Urban Determinants of Health and Wellbeing: Using Explainable Machine Learning Models” The 17th International Association for China Planning (IACP) Conference, Tianjin University, China. July.
- 2022 “Systematic review of spatial determinants of urban health: A policy-to-science approach” The 13th International Urban Planning and Environment Congress, Tartu University, Estonia. Aug.
- 2021 “Delineating fine-scale urban functional use from Points of Interest data with word embedding model.” 13th World Congress of the Regional Science Association International (RSAI) 2018, Virtual, Regional Science Association International. May.
- 2020 “Delineating fine-scale urban functional use from Points of Interest data with word embedding model.” ACSP 2020 Annual Conference, Virtual, Association of Collegiate Schools of Planning. Nov.
- 2020 “Delineating Fine-scale Urban Functional Use from Points of Interest Data with Doc2Vec.” GIScience Research UK (GISRUK) Conference, Birkbeck, University of London and University College London. Jul.
- 2019 “Machine learning the images of a city and informing urban policy making”. Data for Policy 2019: Digital Trust and Personal Data. London, UK. Jun.

Invited Talks

- 2022 2022 UIBE International Symposium and PhD Forum on Global Government Regulation and Governance in the Digital Era, University of International Business and Economics, China. Dec 17th.
- 2022 The 2nd Annual Business Meeting of the eMotional Cities project, Tartu University, Estonia. Jul 30th.
- 2022 Brown Bag Seminar, Department of Land Economy, University of Cambridge, UK.
- 2021 The 1st Annual Business Meeting of the eMotional Cities project, Virtual.
- 2019 Peking University-Cambridge University Joint Workshop on Innovations in Urban Governance, University of Peking, China. Dec.
- 2019 BP ‘Quantum Computing for Smart Cities’ workshop, Institute for Manufacturing, University of Cambridge, UK. May.
- 2018 Centre for Digital Built Britain Summer Showcase 2018, Centre for Digital Built Britain, University of Cambridge, UK. Jul.

2018 The Early Career Researchers' Conference 2018, Department of Land Economy, University of Cambridge, UK. Apr.

TEACHING EXPERIENCE

Department of Land Economy, University of Cambridge

2020–21 **Going Beyond: Big Data and Urban Policy** (Guest Lecturer)

2019–21 **RM03: Spatial Analysis and Modelling** (Guest Lecturer/Supervisors Coordinator)

2017–18 **RM01: Mixed Research Methods Option B** (Guest Lecturer/Supervisor)

School of Architecture and Urban Planning, Huazhong University of Science and Technology

2016–17 **Graduate Project** (Supervisor)

2015–16 **Rural and Urban Design Practice Course** (Supervisor)

SUPERVISING EXPERIENCE

M.Phil. Dissertation Supervisor, University of Cambridge

2021 Xinmeng Tu (MPhil in Land Economy Research)

M.Phil. Dissertation Presentation Panellist, University of Cambridge

2017–18 M.Phil. in Planning, Growth and Regeneration

PROFESSIONAL ACTIVITIES AND SERVICES

Academic Journal Peer Review

- *Humanities and Social Sciences Communications (Springer Nature)*
- *Land Use Policy*
- *Journal of Urban Planning and Development*
- *Knowledge and Information Systems*
- *Urban Planning*

Professional Association

2022– Member, Urban Health Cluster WG2, European Union

2022– Cambridge Data Champion

2021– Cambridge Centre for Data-Driven Discovery

2020– Liaison in UK, Journal of Urban Planning International, China

2018–22 Member, The Association for Geographic Information, UK

2015–17 Member, ICOMOS-International Scientific Committee on Shared Built Heritage – Wuhan Research Centre, China

HONORS AND AWARDS

- 2022 James Claydon Prize (the most outstanding PhD in Economics or related subjects), St Edmund's College, University of Cambridge
- 2021 Academic Awards, St Edmund's College, University of Cambridge
- 2018 China Scholarship Council Scholarship
- 2017 Academic Awards, Huazhong University of Science and Technology
- 2017 Hubei Excellent Urban and Rural Planning Design Award (Third Prize), Hubei Association of City Planning, China
- 2015 HUST Academic Awards, Huazhong University of Science and Technology
- 2015 National Excellent Urban and Rural Planning and Design Award (Third Prize), China Association of City Planning, China

SKILLS

Programming: Python, R, Stata, SQL, Git, HTML

Geospatial and GIS Tools: PostGIS, QGIS, ArcGIS

Computer Proficiency: MS Office, Adobe CC

Updated August 2023