

HUANFA CHEN

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EDUCATION

Doctor of Philosophy <i>Geographic Information Science</i> University College London	Sep 2014 – Feb 2019 London, UK
Master of Science <i>Geographic Information Systems and Cartography</i> Peking University	Sep 2011 – July 2014 Beijing, China
Bachelor of Science <i>Chemistry</i> Peking University	Sep 2007 – July 2011 Beijing, China

WORK EXPERIENCE

Lecturer in Spatial Data Science Centre for Advanced Spatial Analysis, UCL <ul style="list-style-type: none">Lecture in postgraduate modules and supervise MSc and PhD projectsDeputy Department Tutor (since 2020)	Oct 2020 – London, UK
Teaching Fellow in Spatial Data Science Centre for Advanced Spatial Analysis, UCL <ul style="list-style-type: none">Lecture in postgraduate modules and supervise MSc and PhD projectsDeputy Department Tutor (since 2020)	Feb 2019 – London, UK
Guest Lecturer School of Architecture and Cities, University of Westminster <ul style="list-style-type: none">Lecture in GIS and spatial analysis	Jan 2019 – London, UK
Teaching assistant Department of Civil, Environmental and Geomatic Engineering <ul style="list-style-type: none">Lectured in “Agent-Based Simulation” as part of the Msc Course Spatio-Temporal Data MiningLed tutorials in R/Python/NetLogo	Oct 2014 – Jan 2019 London, UK
Research assistant Department of Civil, Environmental and Geomatic Engineering <ul style="list-style-type: none">Member of the EPSRC-funded project ‘Crime, Policing and Citizenship’Developed algorithms for predicting spatio-temporal crime hot-spots and dashboards	Oct 2015 – Jan 2019 London, UK

RESEARCH INTERESTS

Spatial optimisation
Developing new models for location selection, location-allocation analysis, routing, regionalization problems

GeoAI
Developing data-driven GeoAI models, with applications in crime prediction, transport, and public health

Human mobility
Modelling travel mode and purpose in the urban context

Health GIS
Using GIS methods to understand the spatio-temporal patterns of infectious disease and develop containment measures

Refereed journals

1. Huanfa Chen, Alan T. Murray, and Rui Jiang, Open-source approaches for location cover models: capabilities and efficiency, *Journal of Geographical Systems* **23**, 361–380 (2021).
2. Huanfa Chen, Tao Cheng, and Xinyue Ye, Designing efficient and balanced police patrol districts on an urban street network, *International Journal of Geographical Information Science* **33**, 269–290 (2019).
3. Huanfa Chen, Tao Cheng, and John Shawe-Taylor, A Balanced Route Design for Min-Max Multiple-Depot Rural Postman Problem (MMMDRPP): a police patrolling case, *International Journal of Geographical Information Science* **32**, 169–190 (2018).
4. Huanfa Chen, Tao Cheng, and Sarah Wise, Developing an online cooperative police patrol routing strategy, *Computers, Environment and Urban Systems* **62**, 19–29 (2017).
5. Nilufer Sari Aslam, Mohamed R. Ibrahim, Tao Cheng, Huanfa Chen, and Yang Zhang, ActivityNET: Neural networks to predict public transport trip purposes from individual smart card data and POIs, *Geo-spatial Information Science*, 1–11 (2021).
6. Yibin Ren, Huanfa Chen, Yong Han, Tao Cheng, Yang Zhang, and Ge Chen, A hybrid integrated deep learning model for the prediction of citywide spatio-temporal flow volumes, *International Journal of Geographical Information Science* **34**, 802–823 (2020).
7. Yuerong Zhang, Stephen Marshall, Mengqiu Cao, Ed Manley, and Huanfa Chen, Discovering the evolution of urban structure using smart card data: The case of London, *Cities* **112**, 103157 (2021).
8. Yan Qiao, Huanfa Chen, Yiyang Lin, and Jianbin Huang, Controllable synthesis of water-soluble gold nanoparticles and their applications in electrocatalysis and surface-enhanced raman scattering, *Langmuir* **27**, 11090–11097 (2011).
9. Yan Qiao, Huanfa Chen, Yiyang Lin, Zhiyi Yang, Xinhao Cheng, and Jianbin Huang, Photoluminescent lanthanide-doped silica nanotubes: Sol-Gel transcription from functional template, *Journal of Physical Chemistry C* **115**, 7323–7330 (2011).
10. Yan Qiao, Yiyang Lin, Zhiyi Yang, Huanfa Chen, Shaofei Zhang, Yun Yan, and Jianbin Huang, Unique temperature-dependent supramolecular self-assembly: From hierarchical 1D nanostructures to super hydrogel, *Journal of Physical Chemistry B* **114**, 11725–11730 (2010).

Book chapters

1. Huanfa Chen and Alan T. Murray, Open-source approaches for location coverage modelling, in *Open Source Geospatial Science for Urban Studies. Lecture Notes in Intelligent Transportation and Infrastructure.*, edited by Amin Mobasheri (Springer, Cham, 2021) pp. 117–129.

Papers under review

1. Huanfa Chen, Thomas Keel, Mengdie Zhuang, and Nilufer Sari Aslam, Trip purpose prediction using non-sensitive data: a machine learning perspective, *Transportation* **Under review** (2021).
2. Huanfa Chen and Yan Cheng, Travel mode choice prediction using imbalanced machine learning, *IEEE Transactions on Intelligent Transportation Systems* **Under review** (2022).
3. Huanfa Chen, Yanjia Cao, Lingru Feng, and Qunshan Zhao, Measuring and validating spatial accessibility to COVID-19 vaccination sites: a case study in England, *Annals of the American Association of Geographers* **Under review** (2022).
4. Huanfa Chen, Xiaowei Gao, Kangdi Chen, Honghan Bei, and Roberto Murcio, Tackling the spatial disparity of COVID-19 vaccination services: a spatial optimisation approach, *Environment and Planning B: Urban Analytics and City Science* **Under review** (2021).
5. Yutong Xia and Huanfa Chen, A Random Effect Bayesian Neural Network (RE-BNN) for Travel Mode Choice Analysis Across Multiple Regions, *Travel Behaviour and Society* **Under review** (2022).
6. Honghan Bei, Huanfa Chen, Lin Li, Xiaowei Gao, Yutong Xia, and Yutong Sun, Joint prediction of travel mode choice and purpose from travel surveys: a multitask deep learning approach, *Geo-spatial Information Science* **Under review** (2022).

7. Hongbiao Zhao, Xiaowei Gao, and Huanfa Chen, Nonlinear control of decarbonization path following for underactuated ships, *Applied Energy* **Under review** (2022).

Conference proceedings

1. Huanfa Chen and Yang Zhou, Forecasting high-street footfall in real time, in *Proceedings of Geographical Information Science Research - UK 2020* (Online, 2020).
2. Huanfa Chen, Yang Zhang, and Tao Cheng, Locating stations in bike-sharing service: a special maximal covering location problem, in *Proceedings of Geographical Information Science Research - UK 2019* (Newcastle, UK, 2019).
3. Huanfa Chen and Tao Cheng, Modelling Police Patrol Routing as Min-Max Postmen Problems, in *Proceedings of Geographical Information Science Research - UK 2017* (Manchester, UK, 2017).
4. Huanfa Chen and Tao Cheng, Designing police patrol districts on street network, in *Proceedings of the 14th International Conference of GeoComputation* (Leeds, UK, 2017).
5. Yajie Zhu, Qi Li, and Huanfa Chen, System Design of a Simulation System for Hazardous Chemicals Leakage, in *Proceedings of the 12th International Conference of GeoComputation* (Wuhan, China, 2013).
6. Huanfa Chen, Qi Li, Yajie Zhu, and Hamed Karimian, Research of 3D simulation system for chemical accidents based on atmospheric dispersion model, in *Proceedings of International Conference on Earth Science and Environmental Protection 2013* (Kunming, China, 2013).
7. Hamed Karimian, Qi Li, and Huanfa Chen, Correlation between AOD and Pm2.5 over Tehran Iran, in *Proceedings of International Conference on Earth Science and Environmental Protection 2013* (Kunming, China, 2013).

Project reports

1. Tao Cheng, Kate Bowers, Paul Longley, John Shawe-Taylor, Toby Davies, Gabriel Rosser, Sarah Wise, Chris Gale, Monsuru Adepeju, Jianan Shen, Huanfa Chen, Dawn Williams, Kira Kempieńska, and Artemis Skarlatidou, *CPC: Crime, Policing and Citizenship – Intelligent policing and big data*, Tech. Rep. (UCL SpaceTimeLab, London, 2016).

Software

Other significant publications

RESEARCH SUPERVISION

1. University College London, UK, 2019 -

(a) PhD/EngD students (As co-supervisors)

- i. Xiaowei Gao (PhD Geographical Information Science, 2020 –)
 - Research area: Spatio-temporal analytics of cycling mobility
- ii. Meihui Wang (PhD Geographical Information Science, 2020 –)
 - Research area: Urban analytics based on street-view imagery

(b) Master students (selected MSc/MRes projects)

- i. Lingru Feng (MSc Spatial Data Science and Visualisation, 2020 – 2021)
 - Thesis: Comparing Floating Catchment Area Methods for Measuring Spatial Accessibility to COVID-19 Vaccination Service in England
- ii. Chenxi Zhao (MSc Spatial Data Science and Visualisation, 2020 – 2021)
 - Thesis: The relationship between covid-19 and socio-demographic in London: the three lockdowns in 2020
- iii. Huaming Yan (MSc Spatial Data Science and Visualisation, 2020 – 2021)
 - Thesis: Using spatial analysis to measure the fire incidents response time in Greater London

- iv. Yutong Xia (MSc Smart Cities and Urban Analytics, 2020 – 2021)
 - Thesis: A Random Effect Bayesian Neural Network (RE-BNN) for Choice Analysis: Predicting Travel Mode Choice Across Multiple Regions
- v. Yixin Huang (MSc Smart Cities and Urban Analytics, 2020 – 2021)
 - Thesis: Research on spatial accessibility and spatial inequality of vaccination sites in England
- vi. Xiaohan Feng (MSc Spatial Data Science and Visualisation, 2020 – 2021)
 - Thesis: Decomposition Analysis of Index of Multiple Deprivation (IMD) Based on Shapley Value
- vii. Xiaomei Ge (MSc Smart Cities and Urban Analytics, 2019 – 2020)
 - Thesis: Looking into home sharing platforms and their influence on local inequality and insecurity: a case study of London
- viii. Chuyin Deng (MSc Spatial Data Science and Visualisation, 2019 – 2020)
 - Thesis: Exploring the influential factors of cases growth of COVID-19 with machine learning techniques
- ix. Zhenzhi Zhang (MSc Spatial Data Science and Visualisation, 2019 – 2020)
 - Thesis: Understanding public confidence towards NHS by ordered logistics regression based on survey results
- x. Xiang Zhou (MSc Spatial Data Science and Visualisation, 2019 – 2020)
 - Thesis: Solving vehicle routing problems in supply chain using genetic algorithms: a case study in Shanghai
- xi. Yu Fu (MSc Spatial Data Science and Visualisation, 2019 – 2020)
 - Thesis: A real-time forecast of electricity consumption in residential buildings using machine learning approaches
- xii. Thomas Keel (MSc Spatial Data Science and Visualisation, 2018 – 2019)
 - Thesis: Can we predict why people travel within a city? A case study in Montreal, Canada
- xiii. Yang Zhou (MSc Smart Cities and Urban Analytics, 2018 – 2019)
 - Thesis: Retail centre footfall: planning and forecasting using time series modelling
- xiv. Yafei Ye (MRes Spatial Data Science and Visualisation, 2018 – 2019)
 - Thesis: Understanding residents' attitudes towards services and safety issues by geodemographics based on city survey results
- xv. Yunong Wang (MSc Spatial Data Science and Visualisation, 2018 – 2019)
 - Thesis: Optimal siting and sizing of electric vehicle charging points: a case study in London
- xvi. Maria del pilar Mayora (MSc Smart Cities and Urban Analytics, 2018 – 2019)
 - Thesis: An environmental bicycle level of service index for the Buenos Aires cycle network
- xvii. Ziyi Cheng (MSc Smart Cities and Urban Analytics, 2018 – 2019)
 - Thesis: Exploring the spatial accessibility to green space in the Greater London area

CONFERENCES AND PRESENTATIONS

Invited Presentations

Geospatial machine learning: motivations and implications

May 2020

Tianjin University [Online]

Machine learning for urban analytics and transport studies

March 2021

Chinese Academy of Surveying and Mapping [Online]

HONORS AND AWARDS

UCL Q-Step Internship Programme	2021
£3,000 Support for supervising the 6-week internship project	UCL, UK
• Title: Evaluating and Comparing accessibility to Covid-19 vaccination services across different countries	
2019 AAG Applied Geography Specialty Group Project Development Award	2019
\$500 Support for the research project: Uncovering the underlying demand of sharing bicycles in urban areas	US
2019 AAG Applied Geography Specialty Group Travel Award	2019
\$250 Support for attending the AAG annual event	US
Roger Tomlinson Prize	2018
Recognition for the best PhD thesis submitted to UCL which relates to the development of GIS	UCL, UK
Finalist of EPSRC Connected Nation Pioneers Award	2018
Recognition as one of 16 finalists of all UK PhD students due to pioneering research	UK
Future Star Award in Shanghai Open Data Apps Competition	2017
Team leader and algorithm designer	Shanghai, China
• Project title: Planning Docking Stations and Optimising Operations in Sharing Bicycle Management	
Travel Fund for Early-Career Researchers	2017
Receive €300 to attend a three-day Workshop	Leiden University, Netherlands
• Workshop on 'Movement: New Sensors, New Data, New Challenges'	
UCL-CSC Joint Research Scholarship	2014 – 2018
Full PhD scholarship, including tuition fees and expenses.	UCL, UK
Excellent Prize in 2015 ISPRS-Scientific Initiative Open Data Challenge	2015
Top 10/100 teams due to outstanding algorithm performance	Shenzhen, China
Honourable Mention for Best Young Researcher Paper	2015
Receiving \$500 in the first International Symposium on Spatiotemporal Computing	Fairfax, US
China National Petroleum Corporation Scholarship in Peking University	2010
Receiving ¥5,000 due to outstanding academic performance as top 10/150 students	Beijing, China
Merit Student Awards in Peking University	2008
Awarded due to outstanding overall performance as top 20/150 students	Beijing, China

TEACHING EXPERIENCE

CASA0007: Quantitative Methods	2019 –
Teaching mathematical techniques for describing cities and geographies	UCL
CASA0013: Introduction to Programming for Spatial Analysts	2019 –
Hands-on Python course, covering pandas/geopandas/matplotlib/sklearn	UCL
CASA0006: Data Science for Spatial Systems	2019 –
Statistical & machine-learning methods for spatial analysis	UCL
CASA0009: Spatial Data Capture, Storage, & Analysis	2019 –
Various topics including MySQL, Javascript, web applications	UCL
CASA0011: Agent Based Modelling for Spatial Systems	2021 –
Spatially-explicit agent-based models using NetLogo	UCL
CEGE0076: Spatio-Temporal Data Mining	2015 – 2021
Leading tutorials of spatio-temporal analytics using R & NetLogo	UCL
CEGE0082: GIS Principles and Technology	2016 – 2017
Leading tutorials of ArcGIS analysis	UCL

PROFESSIONAL ACTIVITIES

Professional Membership

Member, the American Association of Geographers 2015 –

Professional Service

Board Member, the Chinese Professionals in Geographic Information Sciences 2021 –

General Secretary, Peking University Alumni Association in UK 2016 – 2018
Coordinating 20-person committee and organising 150-person annual meetings. UK

President, London PhD Network 2016 –
Hosting quarterly academic conferences and monthly seminars UK

EDITORSHIP

Editor Board Member, Humanities and Social Sciences Communications 2022 –

Guest Editor on Covid-19 Impact on Human Mobility 2021 – 2022
Geo-spatial Information Science

REFEREE

Journal

International Journal of Geographic Information Science 2015 –

Computers, Environments, and Urban Systems 2018 –

Transportation Research Part C: Emerging Technologies 2019 –

Journal of Homeland Security and Emergency Management 2022 –

SKILLS

Languages: Mandarin (Native), English (Fluent), Cantonese (Fluent), Teochew (Native)

Programming: Python, R, Java, C++, Linux Bash

Applications: Esri ArcGIS, Microsoft Office Suite, LaTeX, Markdown

Interests: badminton, travel, reading, blogging