HUANFA CHEN

huanfa.chen@ucl.ac.uk | https://huanfachen.github.io/ |
linkedin.com/in/huanfa-chen | github.com/huanfachen

EDUCATION

Doctor of Philosophy | *Geographic Information Science* Sep 2014 – Feb 2019
University College London London, UK

Master of Science | *Geographic Information Systems and Cartography* Sep 2011 – July 2014
Peking University Beijing, China

Bachelor of Science | *Chemistry* Sep 2007 – July 2011
Peking University Beijing, China

WORK EXPERIENCE

Lecturer in Spatial Data Science Oct 2020 –
Centre for Advanced Spatial Analysis, UCL London, UK
- Lecture in postgraduate modules and supervise MSc and PhD projects
- Deputy Department Tutor (since 2020)

Teaching Fellow in Spatial Data Science Feb 2019 –
Centre for Advanced Spatial Analysis, UCL London, UK
- Lecture in postgraduate modules and supervise MSc and PhD projects
- Deputy Department Tutor (since 2020)

Guest Lecturer Jan 2019 –
School of Architecture and Cities, University of Westminster London, UK
- Lecture in GIS and spatial analysis

Teaching assistant Oct 2014 – Jan 2019
Department of Civil, Environmental and Geomatic Engineering London, UK
- Lectured in "Agent-Based Simulation" as part of the Msc Course Spatio-Temporal Data Mining
- Led tutorials in R/Python/NetLogo

Research assistant Oct 2015 – Jan 2019
Department of Civil, Environmental and Geomatic Engineering London, UK
- Member of the EPSRC-funded project 'Crime, Policing and Citizenship'
- Developed algorithms for predicting spatio-temporal crime hot-spots and dashboards

RESEARCH INTERESTS

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

GeoAI
- Developing data-driven GeoAI models
- with applications in crime prediction and transport flow prediction

Urban mobility
- Applying econometrics and machine learning models to understand travel mode and purpose in urban contexts

Health GIS
- Using GIS methods to understand the spatio-temporal patterns of infectious disease (e.g. Covid-19)
- Evaluating the performance of control measures (e.g. the varination of vaccination uptake rate and its socio-economic determinants)

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 Kempińska, 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 cast 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