



# 陈焕发

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## 教育经历

理学博士, 地理信息科学 伦敦大学学院 (UCL) (导师: Tao Cheng教授)	2014 – 2019 英国
理学硕士, 地图学与地理信息系统 北京大学 (导师: 李琦教授)	2011 – 2014 中国
理学学士, 化学 北京大学	2007 – 2011 中国

## 工作经历

讲师 (助理教授), 空间数据科学方向 高级空间分析中心, UCL • 博士生导师; 讲授研究生课程 • 副系教务主任(2020年起)	2020年10月– 英国
教员, 空间数据科学方向 高级空间分析中心, UCL • 博士生导师; 讲授研究生课程 • 副系教务主任(2020年起)	2019年2月– 2020年10月 英国
客座教授 建筑与城市学院, University of Westminster • 讲授GIS和空间分析课程	2019年1月– 英国
助教 土木环境与测绘系, UCL • 讲授“多智能体仿真”硕士生课程 • 主持R/Python/NetLogo习题课	2014年10月– 2019年1月 英国
研究助理 土木环境与测绘系, UCL • 参与“犯罪, 警务与市民信心”科研项目, 受英国物理与工程科学基金委 (EPSRC) 资助 • 开发时空犯罪热点预测算法和可视化系统	2015年10月– 2019年1月 英国

## 研究兴趣

- 空间优化
  - 开发新型模型和高性能算法, 以解决公共设施选址/路径规划/区划等优化问题
  - 应用于城市管理/犯罪预防/警员巡逻等
- 时空人工智能
  - 研发时空大数据驱动的神经网络模型和算法
  - 应用于预测犯罪热点/交通流量等
- 城市居民移动模式
  - 融合经济计量学和机器学习模型, 预测和理解居民的个体出行交通模式和目的
- 健康GIS
  - 应用GIS方法以理解传染病 (例如Covid-19) 的时空模式
  - 评估防控措施的效果 (例如居民疫苗接种率的时空变异特征和影响因素)

期刊论文

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).

书籍章节

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 Mobasher (Springer, Cham, 2021) pp. 117–129.

正在评审论文

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).

#### 会议论文

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).

#### 项目报告

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 Kempnińska, and Artemis Skarlatidou, *CPC: Crime, Policing and Citizenship – Intelligent policing and big data*, Tech. Rep. (UCL SpaceTimeLab, London, 2016).

#### 软件项目

#### 其他研究成果

#### 指导学生

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1. 伦敦大学学院, 英国, 2019 –
  - (a) 博士生(作为第二导师)
    - 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) 硕士生(共指导30名硕士生, 以下是部分学生的论文题目)
    - 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

## 会议报告

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### 受邀报告

**Geospatial machine learning: motivations and implications**

2020年5月

天津大学建筑学院

**Machine learning for urban analytics and transport studies**

2021年3月

中国测绘科学研究院

## 荣誉和奖励

<b>UCL Q-Step</b> 学生实习项目 £3,000 资助, 指导本科生科研项目 • 科研项目: 评估全球多国家的Covid-19疫苗服务的可达性	2021 UCL, 英国
<b>2019 AAG Applied Geography Specialty Group Project Development Award</b> \$500 资助, 支持“预测城市地区共享单车需求”的研究项目	2019 美国
<b>2019 AAG Applied Geography Specialty Group Travel Award</b> \$250 参会补贴	2019 US
<b>Roger Tomlinson</b> 论文奖 由ESRI公司资助, 授予UCL指导的地理信息科学方向最佳博士论文	2018 UCL, 英国
<b>EPSRC</b> 互联网社会先行者比赛决赛选手 由英国物理与工程科学基金会发起的比赛, 全英国共500名多领域的博士生参赛, 决赛名单共16人	2018 英国
上海开放数据应用大赛“明日之星”奖励 领队, 负责项目管理和算法开发 • 项目内容: 共享单车的站点选址和运营优化	2017 上海, 中国
年轻研究者的旅行补贴 获得€300 资助, 以参加研讨会 • 研讨会主题: “移动模式: 新传感器, 新数据, 新挑战”	2017 Leiden University, 荷兰
<b>UCL-CSC</b> 联合博士奖学金 博士全额奖学金, 资助期限四年	2014 – 2018 UCL, 英国
<b>2015年ISPRS</b> 开发数据全球挑战赛优秀奖 作为队长, 带队在初赛排名前十 (共100个队伍参赛)	2015 深圳大学, 中国
最佳青年学者论文提名奖 在首届时空计算国际会议获得\$500 奖励	2015 乔治梅森大学, 美国
北京大学-中石油奖学金 学业成绩在全年级排名前10/150; 奖金¥5,000	2010 北京大学, 中国
北京大学三好学生 学业成绩在全年级排名前20/150	2008 北京大学, China

## 教学经历

<b>CASA0007: 定量方法</b> 教授城市研究和空间分析的数学方法基础	2019 – UCL
<b>CASA0013: 空间数据科学基础</b> 基于Python的空间数据科学, 涵盖pandas/geopandas/matplotlib/sklearn	2019 – UCL
<b>CASA0006: 空间数据科学</b> 基于统计学习和机器学习的空间分析方法	2019 – UCL
<b>CASA0009: 空间数据获取, 存储与分析</b> 涵盖MySQL数据库, Javascript, WebGIS网站建设	2019 – UCL
<b>CASA0011: 空间多智能体模型</b> 基于NetLogo编程的空间显式多智能体模型	2021 – UCL
<b>CEGE0076: 时空数据挖掘</b> 基于R语言, 介绍时空数据挖掘常用模型和方法	2015 – 2021 UCL
<b>CEGE0082: GIS思想与方法</b> 讲授基于ArcGIS的GIS习题课	2016 – 2017 UCL

## 协会活动

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### 协会会员

会员, 美国地理学家协会 2015 –

### 协会任职

理事会成员, 国际华人地理信息科学协会 2021 –

秘书长, 北京大学全英校友会 2016 – 2018  
主持20人的理事会, 组织150名参会人员的年会 英国

主席, 伦敦博士联盟 2016 –  
组织多学科领域的学术研讨会; 协会共有800名成员 英国

## 期刊编辑

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编委会成员, **Humanities and Social Sciences Communications** 2022 –

客座编辑, 负责**Covid-19 Impact on Human Mobility**特刊 2021 – 2022  
**Geo-spatial Information Science**

## 评审经历

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### 期刊审稿

**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 –

## 技能

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语言: 普通话, 英语, 粤语, 潮汕话

编程: Python, R, Java, C++, Linux Bash

软件系统: Esri ArcGIS, Microsoft Office Suite, LaTeX, Markdown

业余兴趣: 羽毛球, 旅行, 阅读, 博客写作