Resume of Dr. Zhou HUANG

July, 2023

1 Personal Background

1.1 Personal Data

Name	Zhou HUANG
Birth Date	September 27th, 1983
Birth Place	Jiangxi Province, China
Citizenship	Chinese
Home Address	Haidian District 100871 Beijing, China Tel. (mobile): +86 131 464 995 61

1.2 Affiliation

Associate Professor of Geographical Information Science
Deputy Director of Institute of Remote Sensing and Geographical Information Systems
School of Earth and Space Sciences
Peking University
No.5 Yiheyuan Road, Haidian District
100871 Beijing - China

Email: huangzhou@pku.edu.cn
Phone: +86 13146499561
Fax: +86 10-62760132

Link: https://pku-geocomp.com/ [English homepage]
https://faculty.pku.edu.cn/huangzhou [Chinese homepage]
https://www.researchgate.net/profile/Zhou-Huang-3 [ResearchGate]
https://scholar.google.com/citations?user=BUFSF_8AAAAJ&hl=zh-CN [GoogleScholar]

1.3 Education

2004-2009	Ph.D. in Geographical Information Science, Peking University, Beijing, China Supervisor: Prof. Yu Fang
2000-2004	B.Sc. in Geographical Information Science, Peking University, Beijing, China Supervisor: Prof. Yu Fang

1.4 Professional Expertise

Dr. Zhou Huang is an expert in geospatial big data, high-performance geocomputation, spatial data mining, and spatial databases. Additionally, he is highly knowledgeable in geocomputation tools and GeoAI models, and possesses exceptional coding, analytical, and organizational skills. Dr. Zhou Huang excels in managing and parallel processing large volumes of geospatial data,

including remote sensing images and GIS datasets. In recent years, he has achieved significant results in fusing and analyzing remote sensing data with social sensing data. Through the integration of remote sensing and GIS technologies, he has conducted extensive work on achieving using geospatial big data.

Currently, Dr. Zhou Huang serves as an Associate Editor for the *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (IEEE JSTARS)* as well as the journal *Resources, Environment and Sustainability*.

1.5 Work Positions and Engagements

Work positions

2014 - present	Associate Professor at the Institute of Remote Sensing and Geographical Information Systems, Peking University, Beijing
2011 - 2014	Lecturer at the Institute of Remote Sensing and Geographical Information Systems, Peking University, Beijing
2009 - 2011	Postdoctoral at the School of Earth and Space Sciences, Peking University, Beijing

Engagements

2022 - present	Adjunct Researcher of Satellite News Sector, National Key Laboratory for Media Convergence Production Technology and System, China
2022 - present	Deputy Director of Center for Habitable Intelligent Planet, Institute for Artificial Intelligence, Peking University
2021 - present	Deputy Director of Center for Artificial Intelligence and Earth Science, Peking University
2020 - present	Executive Deputy Director of Beijing Key Lab of Spatial Information Integration & Its Applications, Peking University
2019 - present	Executive Deputy Director of Engineering Research Center of Earth Observation and Navigation, Ministry of Education, China
2018 - present	Deputy Director of Institute of Remote Sensing and Geographical Information Systems, Peking University
2016 - 2019	Core Scientist of Smart City & Space Time Big Data Team, Beijing Future Network High Level Innovation Center

1.6 Fellowships

2023	CICC Global Fund Scholarship for Outstanding Young Scholars, CICC
2021	Peking University Boya Young Fellow, with recognition from the President of Peking University
2013	ICBC (Industrial and Commercial Bank of China) Fellowship, ICBC

1.7 Research Fields, Main Scientific Achievements, and Activities in Projects

Research Fields

Dr. Zhou Huang specializes in the field of geospatial big data, which has gained significant

prominence in recent years due to the exponential growth of spatiotemporal data such as remote sensing images, individual trajectories, and crowdsourced geographic information. The management, processing, and mining of these vast amounts of geospatial data have emerged as crucial research areas. However, traditional geocomputation technologies face three major challenges: “large data volume,” “insufficient computing power,” and “lack of intelligence.” In response to these challenges, Dr. Huang has conducted comprehensive research on geospatial big data, encompassing management models, high-performance computing paradigms, and spatiotemporal mining algorithms. His work aims to advance the capabilities of geospatial big data toolkits towards higher efficiency, greater accuracy, and increased intelligence.

Main Scientific Achievements

Dr. Zhou Huang’s recent research revolves around the development of **innovative GC4US (Geocomputation for Urban Sustainability) methods** using geospatial big data, leading to significant advancements in efficiency, accuracy, and intelligence compared to state-of-the-art approaches. The main academic contributions and innovative achievements in the past five years are:

(1) **Building a more stable spatial infrastructure for geospatial big data**: To address the challenges of handling, managing, and analyzing geospatial big data gathered by various urban sensors, Dr. Huang has proposed several novel approaches focused on storage management of geospatial big data, high-performance geocomputation, and fundamental GeoAI models. These methods provide effective improvements in building a more robust spatial infrastructure and have been applied to social services used by millions of people.

(2) **Human mobility modeling based on geospatial big data**: Dr. Huang has contributed to the exploration of urban residents' activity patterns and behavioral regularities by developing models that intelligently sense human activity, assess the supply and demand of urban public transportation, and provide personalized recommendations for next locations. These models leverage geospatial big data to provide valuable insights for decision-making in urban planning, traffic management, and public services.

(3) **High-resolution measurement for the built environment**: To enhance the quantitative understanding of the built environment, Dr. Huang has proposed a research framework on high-resolution measurement for the built environment. Utilizing multisource geospatial data and deep learning, he identified high-resolution urban land uses and quantified material stocks, shedding light on inherent patterns and the environmental consequences of urban development. This framework offers a transformative perspective on the intricacies and dynamics of the built environment.

(4) **Quantifying human-built environment interactions for future cities**: To address the complex and spatially varying relations between the built environment and human activities within cities, Dr. Huang has employed methods like multiscale geographically weighted regression to quantify how the built environment and human activities influence each other in the context of mobility, emission, and building energy consumption. The findings provide valuable insights for urban planning, emission reduction strategies, and energy conservation policies, thereby contributing to the advancement of sustainable development in future cities.

Activities in Projects

2023 - 2026	**Natural Science Foundation of China (42271471):** "Computing Methods and Applications of Multi-Source Trajectory Big Data for Traffic Infrastructure Optimization", *Principal Investigator*, 560,000 RMB
2019 - 2021	**China-Israel Cooperative Scientific Research Project, National Key Research and Development Program funded by the MOST (2017YFE0196100):** "Mobility as a Service: From Rigid to Smart Evolving Public Transport", *Principal Investigator* (collaborated with Prof. Itzhak Benenson, Tel Aviv University), 1,640,000 RMB
2019 - 2023	**Natural Science Foundation of China (41830645):** "Spatial Interaction Network Theory and Analytical Methods Based on Big Data", *Co-Investigator*, 2,960,000 RMB
2018 - 2021	**Natural Science Foundation of China (41771425):** "Hotspot Mining and Intelligent Recommendation from Geotagged Social Media Data in High-Performance Computing Environments", *Principal Investigator*, 630,000 RMB
2017 - 2021	**National Key Research and Development Program funded by the MOST (2017YFB0503602):** "Geographical Location Perception from Geospatial Big Data", *Co-Investigator*, 3,900,000 RMB
2014 - 2016	**China Economic Reform Promotion and Capacity Enhancement Program funded by the World Bank:** "Software Development for Index-Based Insurance of Wind Disasters in Hainan Rubber Plantations", *Principal Investigator*, 1,090,000 RMB
2013 - 2015	**National Science and Technology Support Program funded by the MOST (2013BAK03B07):** "National Emergency Drill Simulation Service Platform and Its Applications", *Co-Investigator*, 300,000 RMB
2011 - 2014	**National Science and Technology Support Program funded by the MOST (2011BAH06B01):** "Development of Geospatial Information Processing and Analysis Toolkits", *Co-Investigator*, 4,640,000 RMB
2011 - 2013	**Natural Science Foundation of China (41001218)**: "Implementation Techniques of Geospatial Query Workflow in High-Performance Grid Computing System", *Principal Investigator*, 180,000 RMB

1.8 Supervisor of Ph.D

- Ph.D. Tutor, Shuliang Ren, Peking University, 2022-2026.
- Ph.D. Tutor, Yanxiao Jiang, Peking University, 2021-2025.
- Ph.D. Tutor, Jiangpeng Zheng, Peking University, 2021-2025.
- Ph.D. Tutor, Ganmin Yin, Peking University, 2020-2025.
- Ph.D. Tutor, Houji Qi, Peking University, 2019-2025.
- Ph.D. Tutor, Yi Bao, Peking University, 2018-2023.

1.9 Awards and Recognitions

2023	**Outstanding Doctoral Thesis Advisor Award** *Recognition from Peking University (Less than 5% of the doctoral dissertations at the university are awarded the outstanding thesis)*
2023	**CICC Global Fund Scholarship for Outstanding Young Scholars** *Teaching honor based on student course evaluation*
2021	**Young Cheung Kong Scholar** *Faculty early career award in recognition of China's domestic top scholars by the Ministry of Education*
2021	**Peking University Boya Young Fellow** *Title given to outstanding young scholars at Peking University*
2021	**Second Prize of Beijing Science and Technology Progress Award** *Recognition from the Beijing Municipal Government*
2021	**Innovative Person Award of College GIS Forum, China** *Honor from the Chinese College GIS Forum*
2021	**Outstanding Mentor Award of "China Hualu Cup" Innovative Application of Data Intelligence Competition, Dalian** *Honor from the Competition Committee*
2019	**Grand Prize of Geographic Information Technology Progress Award** *Recognition from Chinese Association for Geospatial Industry and Sciences*
2016	**Excellent Mentor for Undergraduate Classes** *Recognition from Peking University*
2015	**Youth Talent Innovation Award in Remote Sensing Science and Technology** *Recognition from the Ministry of Science and Technology, China*
2014	**Rising Star Award of College GIS Forum** *Honor from the Chinese College GIS Forum*
2014	**ICBC Outstanding Teacher Award** *Teaching honor based on student course evaluation*
2013	**Third Prize of 12th Young Teacher Teaching Skill Competition** *Recognition from Peking University*
2012	**Outstanding Postdoctoral Award, Peking University** *Recognition from Peking University*
2011	**Outstanding Doctoral Thesis Award, Peking University** *Recognition from Peking University*

2 Descriptive Biography of Dr. Zhou Huang

Dr. Zhou Huang was born in September 1983 and obtained his B.Sc. and Ph.D. degrees from Peking University in 2004 and 2009, respectively. He is currently an Associate Professor and Doctoral Supervisor at the Institute of Remote Sensing and Geographical Information Systems, Peking University, where he also serves as the Deputy Director. He is a Young Cheung Kong Scholar, bestowed upon China's top young scholars across all fields by the Ministry of Education (The sole recipient from the GIS field in 2021). Additionally, he holds several other positions including Executive Deputy Director of the Beijing Key Lab of Spatial Information Integration

& Its Applications, Executive Deputy Director of the Engineering Research Center of Earth Observation and Navigation, and Deputy Director of the Center for Habitable Intelligent Planet at the Institute for Artificial Intelligence.

Dr. Zhou Huang is an expert in geospatial big data, high-performance geo-computing, spatial data mining, and spatial databases. His recent research revolves around the development of innovative GC4US (Geocomputation for Urban Sustainability) methods using geospatial big data, leading to significant advancements in efficiency, accuracy, and intelligence compared to state-of-the-art approaches. He is also proficient in geocomputation tools and GeoAI models, with exceptional skills in coding, analysis, and organization.

Dr. Zhou Huang has led 5 PI projects and collaborated on 4 Co-I projects, securing research grants totaling over 15.9 million RMB (or equally 2.19 million US dollars). The PI projects include one international collaborative project jointly funded by the Ministry of Science and Technology (MOST) of China and the MOST of Israel, as well as three projects supported by the National Science Foundation of China (NSFC). His publications include over 80 research papers in prominent academic journals and conferences. Among them, he is the first or corresponding author for 43 SCI/SSCI papers and 13 EI papers. In the past five years, he has published 33 SCI journal papers as the first or corresponding author, including 7 papers with impact factors over 10 and 16 papers classified as first-tier by the Chinese Academy of Sciences.

Beyond solving problems solely for the sake of academic values, Dr. Zhou Huang also emphasizes the applicability and shareability of his research that leads to tangible societal benefits. He has released 5 open-source applications such as HiSpatialCluster and has secured 4 innovation patents. His research findings have been adopted by pioneering GIS corporations such as AMap and SuperMap, yielding substantial public benefits. Consequentially, he has been honored with several notable awards including the Grand Prize of the Geographic Information Technology Progress Award (2019), the Innovative Person Award of the College GIS Forum (2021), and the Second Prize of the Beijing Science and Technology Progress Award (2021).

Dr. Zhou Huang has supervised 6 Ph.D. students and 9 M.Sc. students, and he has taught 3 undergraduate courses and 1 graduate course at Peking University.

3. Publications and Patents

▪3.1 Journal papers (*corresponding author)

[1] Bao, Y.; **Huang, Z.*;** Gong, X.; Zhang, Y.; Yin, G.; Wang, H. Optimizing segmented trajectory data storage with HBase for improved spatio-temporal query efficiency. *International Journal of Digital Earth*, 2023, 16(1), 1124-1143.

[2] Zhou, X.; **Huang, Z.*;** Scheuer, B.; Wang, H.; Zhou, G. Liu, Y. High-resolution estimation of building energy consumption at the city level. *Energy*, 2023, 275, 127476.

[3] Ren, S.; **Huang, Z.*;** Bao, Y.; Yin, G.; Yang, J.; Shan, X. Matching end-of-life household vehicle generation and recycling capacity in Chinese cities: A spatio-temporal analysis for 2022–2050. *Science of The Total Environment*, 2023,165498.

[4] **Huang, Z.*;** Bao, Y.; Mao, R.; Wang, H.; Yin, G.; Wan, L.; Qi, H.; Li, Q.; Tang, H.; Liu, Q.; Li, L.; Yu, B.; Guo, Q.; Liu, Y.; Guo, H.*; Liu, G.* Big geodata reveals spatial patterns of built environment stocks across and within cities in China. *Engineering,* 2023. https://doi.org/10.1016/j.eng.2023.05.015.

[5] Hu, Y.*; Wang, Z.; **Huang, Z.;** Liu, Y. PolyBuilding: Polygon transformer for building extraction. *ISPRS Journal of Photogrammetry and Remote Sensing*, 2023, 199, 15-27

[6] Wan, L.; Yin, G.; Wang, J.; Ben-Dor, G.; Ogulenko, A.; **Huang, Z.***. PATRIC: A high performance parallel urban transport simulation framework based on traffic clustering. *Simulation Modelling Practice and Theory*, 2023, 126, 102775.

[7] Wang, H.; Zhou, X.; Guo, H.; Dong, Q.; **Huang, Z.*.** Quantifying spatially varying impacts of public transport on NO_2 concentrations with big geo-data. *Environmental Monitoring and Assessment*, 2023, 195(6), 702.

[8] Zhou, X.; **Huang, Z.*;** Scheuer, B.; Lu, W.; Zhou, G.; Liu, Y. High-resolution spatial assessment of the zero energy potential of buildings with photovoltaic systems at the city level. *Sustainable Cities and Society*, 2023, 93, 104526.

[9] Dong, Q.; **Huang, Z.*;** Zhou, X.; Guo, Y.; Scheuer, B.; Liu, Y. How building and street morphology affect CO_2 emissions: Evidence from a spatially varying relationship analysis in Beijing. *Building and Environment*, 2023, 236, 110258.

[10] Yin, G.; **Huang, Z.*;** Yang, L.; Ben-Elia, E.; Xu, L.; Scheuer, B.; Liu, Y. How to quantify the travel ratio of urban public transport at a high spatial resolution? A novel computational framework with geospatial big data. *International Journal of Applied Earth Observation and Geoinformation*, 2023, 118, 103245.

[11] Yin, G.; **Huang, Z.*;** Bao, Y.; Wang, H.; Li, L.; Ma, X.; Zhang, Y. ConvGCN-RF: A hybrid learning model for commuting flow prediction considering geographical semantics and neighborhood effects. *GeoInformatica*, 2023, 27(2), 137-157.

[12] Yang, T.; Gao, Y.*; **Huang, Z.;** Liu, Y. UPTDNet: A user preference transfer and drift network for cross-city next POI recommendation. *International Journal of Intelligent Systems*, 2023.

[13] **Huang, Z.;** Yin, G.; Peng, X.*; Zhou, X.; Dong, Q. Quantifying the environmental characteristics influencing the attractiveness of commercial agglomerations with big geo-data. *Environment and Planning B: Urban Analytics and City Science*, 2023, https://doi.org/10.1177/23998083231158370.

[14] Bao, Y.; **Huang, Z.*;** Wang, H.; Yin, G.; Zhou, X.; Gao, Y. High-resolution quantification of building stock using multi-source remote sensing imagery and deep learning. *Journal of Industrial Ecology*, 2023, 27(1), 350-361.

[15] Zhou, X.; Dong, Q.; **Huang, Z.*;** Yin, G.; Zhou, G.; Liu, Y. The spatially varying effects of built environment characteristics on the integrated usage of dockless bike-sharing and public transport. *Sustainable Cities and Society*, 2023, 89, 104348.

[16] Bao, Y.; **Huang, Z.*;** Li, L.; Wang, H.; Lin, J.; Liu, G. Evaluating the human use efficiency of urban built environment and their coordinated development in a spatially refined manner. *Resources, Conservation and Recycling*, 2023, 189, 106723.

[17] Jiang, Y.; Zhang, Y.; Liu, Y.; **Huang, Z.*.** A review of urban vitality research in the Chinese world. *Transactions in Urban Data, Science, and Technology*, 2023, https://doi.org/10.1177/27541231231154705.

[18] Wan, L.; Wang, H.; Hong, Y.; Li, R.; Chen, W.; **Huang, Z.*.** iTourSPOT: a context-aware framework for next POI recommendation in location-based social networks. *International Journal of Digital Earth*, 2022, 15(1), 1614-1636.

[19] Wang, H.; **Huang, Z.*;** Zhou, X.; Yin, G.; Bao, Y.; Zhang, Y. DouFu: A double fusion joint learning method for driving trajectory representation. *Knowledge-Based Systems*, 2022, 258, 110035.

[20] Luan, S.; Ke, R.; **Huang, Z.;** Ma, X.* Traffic congestion propagation inference using dynamic Bayesian graph convolution network. *Transportation research part C: emerging technologies*, 2022, 135, 103526.

[21] Xing, X.; Yuan, Y.; **Huang, Z.;** Peng, X.; Zhao, P.; Liu, Y.* Flow trace: A novel representation of intra-urban movement dynamics. *Computers, Environment and Urban Systems*, 2022, 96, 101832.

[22] Zhou, X.; Wang, H.; **Huang, Z.*;** Bao, Y.; Zhou, G.; Liu, Y. Identifying spatiotemporal characteristics and driving factors for road traffic CO_2 emissions. *Science of The Total Environment,* 2022, 834, 155270.

[23] Ye, R.; **Huang, Z.*;** Li, L.; Shan, X. GeoUNet: A novel AI model for high-resolution mapping of ecological footprint. *International Journal of Applied Earth Observation and Geoinformation*, 2022, 112, 102803.

[24] Zhou, X.; **Huang, Z.*;** Wang, H.; Yin, G.; Bao, Y.; Dong, Q.; Liu, Y. Site selection for hybrid offshore wind and wave power plants using a four-stage framework: A case study in Hainan, China. *Ocean & Coastal Management*, 2022, 218, 106035.

[25] Wang, Y.; **Huang, Z.*;** Yin, G.; Li, H.; Yang, L.; Su, Y.; Liu, Y.; Shan, X. Applying Ollivier-Ricci curvature to indicate the mismatch of travel demand and supply in urban transit network. *International Journal of Applied Earth Observation and Geoinformation*, 2022, 106, 102666.

[26] Yang, X.; Deng, M.*; Shi, Y.; Tang, J.; **Huang, Z.;** Liu, Y. Detecting statistically significant geographical anomalous regions from spatial sampling points by coupling Gaussian function and multidirectional optimization. *Transactions in GIS*, 2021, 25(3), 1277-1300.

[27] Feng, Y.; **Huang, Z.*;** Wang, Y.; Wan, L.; Liu, Y.; Zhang, Y.; Shan, X. An SOE-based learning framework using multisource big data for identifying urban functional zones. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2021, 14, 7336-7348.

[28] Bao, Y.; **Huang, Z.*;** Li, L.; Wang, Y.; Liu, Y. A BiLSTM-CNN model for predicting users' next locations based on geotagged social media. *International Journal of Geographical Information Science*, 2021, *35*(4), 639-660.

[29] Dong, L.; **Huang, Z**.; Zhang, J.; Liu, Y.* Understanding the mesoscopic scaling patterns within cities. *Scientific reports*, 2020, 10(1), 21201.

[30] Lin, S.; Fu, Y.; Jia, X.; Ding, S.*; Wu, Y.; **Huang, Z.*.** Discovering correlations between the COVID-19 epidemic spread and climate. *International Journal of Environmental Research and Public Health*, 2020, 17(21), 7958.

[31] **Huang, Z.;** Qi, H.; Kang, C.*; Su, Y.; Liu, Y. An ensemble learning approach for urban land use mapping based on remote sensing imagery and social sensing data. *Remote Sensing*, 2020, 12(19), 3254.

[32] Xing, X.; **Huang, Z.*;** Cheng, X.; Zhu, D.; Kang, C.; Zhang, F.; Liu, Y. Mapping human

activity volumes through remote sensing imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2020, 13, 5652-5668.

[33] Wu, L.; Cheng, X.; Kang, C.; Zhu, D.; **Huang, Z.;** Liu, Y.* A framework for mixed-use decomposition based on temporal activity signatures extracted from big geo-data. *International Journal of Digital Earth*, 2020, 13(6), 708-726.

[34] Peng, X.; Bao, Y.; **Huang, Z.*.** Perceiving Beijing's "city image" across different groups based on geotagged social media data. *IEEE Access*, 2020, 8, 93868-93881.

[35] Zhang, F.*; Zu, J.; Hu, M.; Zhu, D.; Kang, Y.; Gao, S.; Zhang, Yi.; **Huang, Z**. Uncovering inconspicuous places using social media check-ins and street view images. *Computers, Environment and Urban Systems*, 2020, 81, 101478.

[36] Mao, R.; Bao, Y.; **Huang, Z.*;** Liu, Q.; Liu, G.* High-resolution mapping of the urban built environment stocks in Beijing. *Environmental Science & Technology*, 2020, 54(9), 5345-5355.

[37] Gong, X.; **Huang, Z.*;** Wang, Y.; Wu, L.; Liu, Y. High-performance spatiotemporal trajectory matching across heterogeneous data sources. *Future Generation Computer Systems*, 2020, 105, 148-161.

[38] Zhu, D.; Zhang, F.; Wang, S.; Wang, Y.; Cheng, X.; **Huang, Z.;** Liu, Y.* Understanding place characteristics in geographic contexts through graph convolutional neural networks. *Annals of the American Association of Geographers*, 2020, 110(2), 408-420.

[39] Wang, Y.; Zhu, D.; Yin, G.; **Huang, Z.*;** Liu, Y. A unified spatial multigraph analysis for public transport performance. *Scientific Reports*, 2020, 10(1), 9573.

[40] Wu, L.; Yang, L.; **Huang, Z.*;** Wang, Y.; Chai, Y.; Peng, X.; Liu, Y. Inferring demographics from human trajectories and geographical context. *Computers, Environment and Urban Systems*, 2019, 77, 101368.

[41] Sun, X.; **Huang, Z.*;** Peng, X.; Chen, Y.; Liu, Y. Building a model-based personalised recommendation approach for tourist attractions from geotagged social media data. *International Journal of Digital Earth*, 2019, 12(6), 661-678.

[42] Wang, Y.; Dong, L.; Liu, Y.; **Huang, Z.;** Liu, Y.* Migration patterns in China extracted from mobile positioning data. *Habitat International*, 2019, 86, 71-80.

[43] Wan, L.; Hong, Y.*; **Huang, Z.;** Peng, X.; Li, R. A hybrid ensemble learning method for tourist route recommendations based on geo-tagged social networks. *International Journal of Geographical Information Science*, 2018, 32(11), 2225-2246.

[44] Chen, Y.; **Huang, Z.*;** Pei, T.; Liu, Y. HiSpatialCluster: A novel high-performance software tool for clustering massive spatial points. *Transactions in GIS*, 2018, 22(5), 1275-1298.

[45] Lin, S.; Fang, W.; Wu, X.; Chen, Y.; **Huang, Z.*.** A spark-based high performance computational approach for simulating typhoon wind fields. *IEEE Access*, 2018, 6, 39072-39085.

[46] Wu, X.; **Huang, Z.*;** Peng, X.; Chen, Y.; Liu, Y. Building a spatially-embedded network of tourism hotspots from geotagged social media data. *IEEE Access*, 2018, 6, 21945-21955.

[47] Zhu, D.; **Huang, Z.;** Shi, L.; Wu, L.; Liu, Y.* Inferring spatial interaction patterns from sequential snapshots of spatial distributions. *International Journal of Geographical Information Science*, 2018, 32(4), 783-805.

[48] **Huang, Z.;** Chen, Y.; Wan, L.; Peng, X.* GeoSpark SQL: An effective framework enabling spatial queries on spark. *ISPRS International Journal of Geo-Information*, 2017, 6(9), 285.

[49] Peng, X.; **Huang, Z.*** A novel popular tourist attraction discovering approach based on geo-tagged social media big data. *ISPRS International Journal of Geo-Information*, 2017, 6(7), 216.

[50] Xie, X.; Wen, Y.*; **Huang, Z.** An advanced wind vector retrieval algorithm for the rotating fan-beam scatterometer. *Acta Oceanologica Sinica*, 2017, 36, 83-89.

[51] Wan, L.; **Huang, Z.*;** Peng, X. An effective NoSQL-based vector map tile management approach. *ISPRS International Journal of Geo-Information*, 2016, 5(11), 215.

[52] Xie, X.; **Huang, Z.*;** Lin, M.; Chen, K.; Lan, Y.; Yuan, X.; Ye, X.; Zou, J. A novel integrated algorithm for wind vector retrieval from conically scanning scatterometers. *Remote Sensing*, 2013, 5(12), 6180-6197.

[53] Peng, X.; **Huang, Z.***. Enabling semantic queries against the spatial database. *Advances in Electrical and Computer Engineering*, 2012, 12(1), 45-50.

[54] **Huang, Z.*;** Fang, Y.; Chen, B.; Wu, L.; Pan, M. Building the distributed geographic SQL workflow in the Grid environment. *International Journal of Geographical Information Science*, 2011, 25(7), 1117-1145.

[55] **Huang, Z.*;** Fang, Y.; Chen, B.; Pan, M. An effective framework for distributed geospatial query processing in grids. *Advances in Electrical and Computer Engineering*, 2010. 10(3), 3-10.

[56] Chen, B.; Huang, F.*; Fang, Y.; **Huang, Z.;** Lin, H. An approach for heterogeneous and loosely coupled geospatial data distributed computing. *Computers & geosciences*, 2010, 36(7), 839-847.

[57] **Huang, Z.;** Fang, Y.; Pan, M.* Toward an integrated framework for geosensor grid. *International Journal of Digital Earth*. 2010, 3(2), 207-216.

[58] **Huang, Z.*;** Fang, Y.; Xie, X.; Pan, M. Geobarn: a practical grid geospatial database system. *Advances in Electrical and Computer Engineering*, 2009, 9(3), 7-11.

[59] Lin, J.; Fang, Y.*; Zhang, W.; **Huang, Z**. Fundamental aspects of access control for geospatial data. *International Journal of Digital Earth*, 2009, 2(3), 275-289.

[60] Fang, Y.; **Huang, Z.**; Chen, B.*; Wu, L.; Yin, D. Architecture and key technologies of grid geographic information system. *Science in China Series E: Technological Sciences*, 2008, 51(Suppl 1), 102-113.

▪3.2 Articles submitted and in review

[1] Bao, Y.; **Huang, Z.*;** Mao R.; Liu G.; Wang H.; Yin G. High-resolution mapping of material stocks in the built environment across 50 Chinese cities. *Resources, Conservation & Recycling*, 2023, with major revision.

[2] Qi, H.; **Huang, Z.*;** Chen, Y.; Zhang, Y.; Gao, Y. A heterogeneous streaming processing framework for online map matching based on Spark and GPU computing. *International Journal of Geographical Information Science*, 2023, resubmitted.

[3] Jiang, Y.; **Huang, Z.*;** Li, L.; Dong Q. Local-global dual attention network (LGANet) for population estimation using remote sensing imagery. *Resources, Environment and Sustainability*, 2023, with major revision.

[4] Jiang, Y.; **Huang, Z.*;** Zhou, X.; Chen X. Evaluating the impact of urban morphology on

urban vitality: an exploratory study using big geo-data. *International Journal of Digital Earth*, 2023, under review.

[5] Du, H.; **Huang, Z.*;** Zhang Y.; Zhang Y. An optimized edge-focused Siamese network for monitoring new illegal buildings using satellite images. *IEEE Transactions on Geoscience and Remote Sensing*, 2023, with resubmission.

[6] Zheng, J.; **Huang, Z.*;** Zhou X.; Cao X.; Wang H. Spatiotemporal analysis of CO_2 emissions and emission reduction potential of Beijing buses using smart card data. *Sustainable Cities and Society*, 2023, under review.

[7] Fu, C.; **Huang, Z.*;** Scheuer, B.; Lin, J.; Zhang, Y. Integration of dockless bike-sharing and metro: Prediction and explanation at origin-destination level. *Sustainable Cities and Society*, 2023, under review.

[8] Wang, Z.; Ruan, S.; Zhou, H.; Zhang, S.; Wang, Y.; Liu, Y.; **Huang, Z.*.** TSP: A lightweight mlp for efficient multivariate time series forecasting. *Advances in Neural Information Processing Systems*, 2023, under review.

▪ 3.3 Manuscripts in preparation and to be submitted

[1] Wang, H.; **Huang, Z.*;** Yin, G.M.; Bao, Y.; Zhou, X.; Gao, Y. GWRBoost: A geographically weighted gradient boosting method for explainable quantification of spatially-varying relationships. arXiv preprint arXiv:2212.05814, 2022, in preparation and to be submitted.

[2] Qi, H.; **Huang Z.*.** Enhancing urban road lighting efficiency through analysis of geospatial big data: A supply-demand matching perspective. *Remote Sensing of Environment*, 2023, in preparation and to be submitted.

[3] **Huang, Z.*;** Yin, G.; Bao, Y.; Wang, H.; Zhou, X. Unveiling the inequality and regularity of three-dimensional urban growth in Chinese cities from 2000 to 2020. *Nature Cities*, 2023, in preparation and to be submitted.

[4] Yin, G.; **Huang, Z.*.** Examining active mobility behavior through explainable machine learning: Insights from Beijing, China. *Transportation Research Part D: Transport and Environment*, 2023, in preparation and to be submitted.

[5] Zhang, Z.; **Huang, Z.*.** Arctic sea ice prediction with AIceNet. *IEEE Transactions on Geoscience and Remote Sensing*, 2023, in preparation and to be submitted.

▪ 3.4 Patents

[1] **Huang, Z.**; Chen, Y.; Gong, X.; Wang, Y.; Liu, Y. A real-time map matching method based on a hybrid parallel computing architecture with GPUs and Spark, 2022, ZL202010338544.4.

[2] Yang, L.; **Huang, Z.** A method for classifying the supply-demand status of urban public transportation at a fine spatial scale based on the travel ratio, 2022, ZL202010794900.3

[3] **Huang, Z.**; Wang, J.; Zhu, R. A parallel traffic simulation method based on traffic clustering, 2022, ZL202110187648.4.

[4] Wang, Y.; **Huang, Z.**; Yin, G.; Yang, L. An evaluation and optimization method for public transport network based on Ollivier-Ricci curvature, 2022, ZL202010460888.2

Dr. Zhou Huang has also authored over 20 papers in book chapters and conference proceedings,

including prestigious events such as IGARSS, Geoinformatics, and GEOProcessing.

4. Academic Communications

▪ 4.1 Conference organization

- Initializer and organizer of the “Weiming Forum” of the Peking University remote sensing and geographic information seminar series. Over the past 5 years, this forum has served as a crucial platform for international exchange in the field of geographical information science at Peking University. During this time, I have invited 20 professors from both domestic and foreign institutions to present at Peking University. For example, in April 2019, I extended an invitation to John P. Wilson, a professor at USC and editor-in-chief of Transactions in GIS, to deliver a speech titled "The Present and Future Landscape of Geographical Information Science, With and Without Geo-design."
- International Forum on Big Data for Sustainable Development Goals (FBAS) Organizing Committee, Committee Member; Session on “Spatiotemporal Intelligence and Remote Sensing of the Environment Towards Sustainable Development Goals”, Session Chair (2023).
- The 18th Chinese Annual Conference of Geographic Information Science, Theory and Method, Workshop on “Trajectory Data Mining”, Co-chair (2023)
- The 4th International Youth Forum on Remote Sensing and Geographic Information of Peking University, Organizing Committee, Co-chair (2023)
- International Forum on Big Data for Sustainable Development Goals (FBAS) Organizing Committee, Committee Member (2022)
- International Graduate Workshop on Geo-Informatics (IGWG), Organizing Committee, Co-chair (2022)
- PKU Emerging Engineering International Forum, Organizing Committee, Committee Member (2022)
- International Graduate Workshop on Geo-Informatics (IGWG), Organizing Committee, Co-chair (2021)
- PKU Emerging Engineering International Forum, Organizing Committee, Committee Member (2021)
- International Graduate Workshop on Geo-Informatics (IGWG), Organizing Committee, Committee Member (2020)
- The 3rd International Youth Forum on Remote Sensing and Geographic Information of Peking University, Organizing Committee, Chair (2019)
- International Conference on Advanced Geographic Information Systems, Applications, and Services (GEOProcessing), Program Committee, Committee Member (2016)
- International Conference on Advanced Geographic Information Systems, Applications, and Services (GEOProcessing), Program Committee, Committee Member (2015)
- International Conference on Advanced Geographic Information Systems, Applications, and Services (GEOProcessing), Program Committee, Committee Member (2014)
- International Conference on Advanced Geographic Information Systems, Applications, and Services (GEOProcessing), Program Committee, Committee Member (2013)
- International Conference on Advanced Geographic Information Systems, Applications, and Services (GEOProcessing), Program Committee, Committee Member (2012)
- International Conference on Advanced Geographic Information Systems, Applications, and

Services (GEOProcessing), Program Committee, Committee Member (2011)
- International Conference on Geoinformatics (Geoinformatics), Session on "Distributed GIS", Session Chair (2010)

▪ 4.2 Conference presentation

- The 20th Premium Graduate Course on quantitative remote sensing at Peking University Summer School, "Sensing Urban Built Environment Stocks from Multi-source Spatiotemporal Big Data", Invited lecture (2023, Beijing)
- The 129th Smart Earth International Lecture, "Urban Tourism Knowledge Discovery under the Perspective of Spatiotemporal Intelligence", Invited lecture (2022, Online webinar)
- The First Young Scientists Salon for Surveying, Mapping, and Geographic Information, Chinese Society for Geodesy Photogrammetry and Cartography, "Spatial Perception of the Urban Built Environment Stocks Using Geospatial Big Data", Invited lecture (2021, Beijing)
- The 5th Geographic Information Science Forum on Geospatial Intelligence, "Location Estimation Based on Social Media Geospatial Big Data", Invited lecture (2021, Online webinar)
- The 18th International Symposium on Web and Wireless Geographical Information Systems (W2GIS), "Intelligent Recommendation Based on Geotagged Social Media Big Data", Oral (2020, Wuhan)
- International Workshop on Mobility as a Service: From Rigid to Smart Evolving Public Transport, "Overview to Geospatial Big Data Research", Invited lecture (2019, Tel Aviv, Israel)
- The 2nd International Conference on Urban Informatics (ICUI), "Perceiving City Image Across Different Groups Based on Geotagged Social Media Data", Oral (2019, Hong Kong)
- National Seminar of Young Geographer, "Perception of City Image in Beijing from the Perspective of Microblog", Invited lecture (2017, Wuhu, Anhui)

5. Public Services

▪ 5.1 School and university services

- Deputy Director, Institute of Remote Sensing and GIS, School of Earth and Space Sciences (SESS), Peking University
- Deputy Director of Center for Artificial Intelligence and Earth Science, Peking University
- Executive Deputy Director of Beijing Key Lab of Spatial Information Integration & Its Applications, Peking University
- Executive Deputy Director of Engineering Research Center of Earth Observation and Navigation, Ministry of Education, China
- Deputy Director of the Center for Habitable Intelligent Planet, Institute for Artificial Intelligence, Peking University
- Repeatedly assumed the roles of undergraduate freshman mentor, member of undergraduate enrollment team in Jiangxi, and undergraduate class advisor (2012-2016, Class 5, Grade 12 undergraduate class in SESS).

▪ 5.2 Editorial services

- Associate Editor, ***IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*** (IF=5.5, one of the four prestigious academic journals of IEEE GRSS, i.e., the Geoscience and Remote Sensing Division of IEEE), IEEE

- Associate Editor, ***Resources, Environment and Sustainability***, Elsevier
- Editorial Board Member, ***International Journal of Digital Earth*** (IF=5.1, the official journal of the International Society for Digital Earth), Taylor & Francis
- As a Guest Editor, Dr. Zhou Huang has organized 5 special issues in international journals:
  - *(1)* ***Urban Climate*** (IF=6.4): Special Issue on "Unlocking lnsights into UrbanClimate with the Application of Spatio-Temporal Big Data"
  - *(2)* ***GIScience & Remote Sensing*** (IF=6.7): Special Issue on "Trajectory Data Computing and Mining"
  - *(3)* ***IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*** (IF=5.5): Special Issue on "Geospatial Data Science and Computational Intelligence in Remote Sensing and its Impact on Environmental Sustainability"
  - *(4)* ***Electronics*** (IF=2.9): Special Issue on "Innovative System Architectures for High-Performance Geospatial Computing"
  - *(5)* ***Resources, Environment and Sustainability*** (CiteScore=8.7): Special Issue on "Geocomputation for resources and environmental sciences ".

▪ 5.3 Society membership

- A series of memberships in international societies: IEEE member, ACM member, ISDE member, and CPGIS member
- Member of the Theory and Methodology Committee, China Association for Geospatial Industry and Sciences
- Member of Photogrammetry and Remote Sensing Committee, Chinese Society for Geodesy Photogrammetry and Cartography
- Member of International Space-Time Information Comprehensive Service Professional Committee, Chinese Association for GNSS & LBS
- Member of the Academic Committee of the Key Laboratory of the Ministry of Public Security for Police Geographic Information Technology, China

5.4 Reviewer for refereed journals (A-Z)

- Annals of GIS; Annals of the American Association of Geographers; Applied Sciences; Arabian Journal of Geosciences; Asian Journal of Geographical Research
- Big Earth Data
- Cities; Computers and Geosciences; Computers, Environment and Urban Systems
- Environmental Earth Sciences; Environment and Planning B: Urban Analytics and City Science; Environmental Science & Technology
- Frontiers in Ecology and Evolution
- Geoscience and Remote Sensing Letters; GIScience & Remote Sensing
- Heliyon
- IEEE Access; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; IEEE Transactions on Industrial Informatics; Information Processing and Management; Information Sciences; International Journal of Applied Earth Observation and Geoinformation; International Journal of Digital Earth; International Journal of Geographical Information Science; ISPRS International Journal of Geo-Information; ISPRS Journal of Photogrammetry and Remote Sensing

- Journal of Cleaner Production; Journal of Environmental Management; Journal of Spatial Science
- Landscape and Urban Planning
- PLOS One
- Remote Sensing; Remote Sensing of Environment; Resources, Conservation & Recycling
- Science of The Total Environment; Sensors; Sustainability; Scientific Reports; Sustainable Cities and Society
- Transactions on Knowledge and Data Engineering; Transactions in GIS