Jinzhou Cao, Ph.D.

Shenzhen high-level talent
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Born on Feb. 6th, 1991
Hometown: Yiyang, Hunan

CONCENTRATION

- Urban big data modelling, analysis and mining
- Data science, Data mining, Artificial intelligence
- Smart cities, Spatial statistics, Geo-computation
- Geographic information science and technology as well as their applications

PROFESSIONAL APPOINTMENT

2021.09 -NOW   **Research Associate**, *School of Architecture and Urban Planning, Shenzhen University*, Guangdong Key Laboratory of Urban Informatics.

2019.09 -2021.08   **Postdoctoral Researcher** , *School of Architecture and Urban Planning, Shenzhen University*, Guangdong Key Laboratory of Urban Informatics.

- Cooperation advisor: Prof. Li Qingquan.

EDUCATION

2013.09 -2019.06   **Ph.D.**, *State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS)*, Wuhan University, Urban big data mining.

- Advisor: Prof. Li Qingquan.
- Top Ten Academic Star for Postgraduates, National Scholarship for Graduate Students.

2017.09-2018.09   **Joint Ph.D.**, *School of Civil and Environmental Engineering, University of Washington, U.S.A*, THINK LAB.

2009.09-2013.06   **B.S.**, *School of Remote Sensing and Information Engineering*, Wuhan University, Major in Geographic Information Science.

- Outstanding Graduate,GPA: *3.7/4.0*, Grades ranking *(4/69)*.
- University Scholarship, Excellent Student Award, Outstanding Graduates, etc.

RESEARCH PROJECTS

Projects in lead

2021.10 -2023.10   **Shenzhen Postdoctoral Research Subsidy Project**, *¥300K*, PI.

2021.01 -2023.12   **National Natural Science Foundation of China**, *Study on the multi-scaled identification of urban dynamic functions based on mobile phone big data*, *¥300K*, PI.

2020.06 -2021.12   **China Postdoctoral Science Foundation**, *Research on multi-scalef prediction of urban functions based on big data*, *¥80K*, PI.

2020.01 -2021.07	**Open Fund of Key Laboratory of Urban Land Resources Monitoring and Simulation, Ministry of Natural Resources**, *Suitability assessment of urban travel patterns and spatial structures based on multi-sourced spatial-temporal trajectories, ¥155K*, PI.
2020.11 -2022.10	**Open Fund of Key Laboratory of National Geographic Census and Monitoring ,Ministry of Natural Resources**, *Research on dynamic monitoring method of urban functions based on deep learning, ¥100K*, PI.

Particiapted projects

2021.01 -2022.12	**National Key R&D Program**, *Research and demonstration of comprehensive decision-making and collaborative services in mega-city region of the Greater Bay Area (Subtopic 4):Megalopolis cooperative management service and intelligent decision optimization technology, ¥2740K*, Core members.
2019.04 -2022.04	**China-EU Cooperation Project of National Natural Science Foundation of China** , *SIMETRI: Sustainable Mobility and Equality in Megacity Regions - Patterns, Mechanisms and Governance, ¥2000K*, Core members.
2016.01 -2018.12	**National Major Research Plan Cultivation Project**, *Collective spatiotemporal movement law mining and dynamic modeling based on multi-source spatio-temporal big data,¥430K*, Core members.
2012.08 -2015.12	**Shenzhen Science and Technology Innovation Committee Strategic Emerging Industry Development Special Fund Project**, *Research on collective activity recognition and urban spatial structure evolution based on multi-source spatio-temporal data, ¥4000K*, Core members.

▬▬▬ RESEARCH EXPERIENCES

2019.06-NOW	Monitoring of urban functional areas based on deep learning
	○ Proposed a representation learning framework of multi-source urban data, built a multi-scale reference model of urban functions based on graph neural network, and analyzed the temporal and spatial dynamic patterns of functional distribution, which can be applied to urban planning, smart government and other fields.
2019.01-2020.06	Computing platform for mega-city region perception driven by urban big data
	○ Constructed a multi-dimensional urban indicators ("Population-Economy-Transport-Travel-Land-Facilities") for the Greater Bay Area, realized unified multi-source heterogeneous data management and modeling, and built a visual computing platform to support urban simulation in mega-urban areas driven by big data.
2014.06-2018.06	High-precision residents' trajectory perception based on multi-sourced big data
	○ Realized the intelligent processing of massive trajectory big data, developed trajectory reconstruction and semantic labeling algorithms based on machine learning, and obtained trajectory data sets with high spatiotemporal accuracy and high semantic levels, which can be applied to recommendation systems, smart navigation and other fields.

▬▬▬ TEACHING EXPERIENCES

Spring 2021	Spatial statistics and analysis
	○ A general education course that introduces basic knowledge of spatial statistics and skills necessary to understand the complex spatial patterns.
Fall 2020	Professional English
	○ Provided students with an overview of English terminology in GIS field and introduced the latest geospatial technologies and published papers.

Spring 2014   Android development and practice

   ○ An experimental course designed to immerse students in the fundamental programming concepts and technologies that support mobile Android development.

PUBLICATIONS

2021   **Jinzhou Cao**, Qingquan Li, Wei Tu,Chen Zhong.   Resolving urban mobility networks from individual travel graphs using massive mobile phone tracking data. *Cities*. 2021,110: 103077. (SSCI, JCR Q1 TOP)

Jinzhou Cao. Big data-driven research on the interaction of human mobility pattern and urban spatial structure. *Acta Geodaetica et Cartographica Sinica*. 2021,50(6):849-849. (EI, *in Chinese*)

2020   Wei Tu,**Jinzhou Cao**,Qili Gao, Rui Cao, Zhixiang Fang, Yang Yue, Qingquan Li. Sensing Urban Dynamics by Fusing Multi-sourced Spatiotemporal Big Data. *Geomatics and Information Science of Wuhan University*. 2020, 45(12): 1875-1883. (EI)

Wei Tu, Yatao Zhang, Qingquan Li, Ke Mai, **Jinzhou Cao**. Scale Effect on Fusing Remote Sensing and Human Sensing to Portray Urban Functions *IEEE GEOSCIENCE AND REMOTE SENSING LETTERS*. 2020, 49(3):365-374. (SCI)

2019   **Jinzhou Cao**, Qingquan Li, Wei Tu,Feilong Wang.   Characterizing preferred motif choices and distance impacts. *Plos ONE*. 2019, 14(4): e0215242. (SCI)

Feilong Wang, Jingxing Wang, **Jinzhou Cao**, Cynthia Chen, Xuegang Ban. Extracting Trips from Multi-Sourced Data for Mobility Pattern Analysis: An App-Based Data Example. *Transportation Research Part C*. 2019, 105. 183-202. (SCI)

2018   **Jinzhou Cao**, Wei Tu, Qingquan Li. Uncovering motif patterns from mobile phone positioning data. *Association of American Geographers Annual Meeting*. 2018. New Orleans, USA.

Wei Tu, Zhongwen Hu, Lefei Li, **Jinzhou Cao**, Jincheng Jiang, Qiuping Li, Qingquan Li. Portraying Urban Functional Zones by Coupling Remote Sensing Imagery and Human Sensing Data. *Remote sensing*. 2018, 10(1), 141. (SCI)

Rui Cao, Jiasong Zhu, Wei Tu, Qingquan Li, **Jinzhou Cao**, Bozhi Liu, Qian Zhang, Guoping Qiu. Integrating Aerial and Street View Images for Urban Land Use Classification. *Remote Sensing*. 2018, 10.10: 1553. (SCI)

2017   Wei Tu, **Jinzhou Cao**, Yang Yue, Shih-Lung Shaw, Meng Zhou, Zhensheng Wang, Xiaomeng Chang, Yang Xu, Qingquan Li. Coupling mobile phone and social media data: a new approach to understanding urban functions and diurnal patterns. *International Journal of Geographical Information Science*. 2017, 31(12), 2331-2358. (SCI, Highly Cited Papers)

CAO Jinzhou, TU Wei, LI Qingquan, CAO Rui. Spatio-temporal analysis of aggregated human activities based on massive mobile phone tracking data. *Journal of Geoinformation Science*,2017, 19(4): 467-474. (*in Chinese*)

2016   Rui Cao, Wei Tu, **Jinzhou Cao**, Qingquan Li. Comparison of Urban Human Movements inferring from multi-sources spatio-temporal data. *International Society for Photogrammetry and Remote Sensing Congress*. 2016. Prague. (A&HCI)

Wei Tu, Rui Cao, **Jinzhou Cao**, Qingquan Li. Spatial-temporal variation of public transit ridership using smart card data and mobile phone data. *Association of American Geographers Annual Meeting*. 2016. San Francisco, USA.

2015   **Jinzhou Cao**, Wei Tu, Qingquan Li, Meng Zhou, Rui Cao. Exploring the distribution and dynamics of functional regions using mobile phone data and social media data. *14th International Conference on Computers in Urban Planning and Urban Management.* 2015. Boston, USA.

2014   **Jinzhou Cao**, Qingwu Hu, Qingquan Li. A study of users' movements based on check-in data in location-based social networks. In *Web and Wireless Geographical Information Systems, W2GIS 2014*, volume 8470 of *Lecture Notes in Computer Science*, 2014. (EI)

2013   **Jinzhou CAO**, Hongyu Wu. Update approach of pois based on weibo position check-in data. *Geospatial Information*, 11(2), 2013. (*in Chinese*)

▬▬▬ PATENTS AND SOFTWARES

Patents   Wei Tu, **Jinzhou Cao**. Megalopolis space simulation method, system and equipment based on cellular automata(ZL202010858272.0)

Wei Tu, Tianhong Zhao, Zhengdong Huang, **Jinzhou Cao**. A measuring method, equipment and storage medium based on the interaction of megalopolis elements(ZL202010939772.7)

Wei Tu, **Jinzhou Cao**. Collective activity data collection method and system based on multi-source spatio-temporal trajectory data(CN106211071A)

Wei Tu, **Jinzhou Cao**. Method and system for consistency checking and fusion of multi-source location data(CN106203467A)

Shaoqing Shen, Tu Wei, **Jinzhou Cao**. Method and system for identifying traffic facilities to be improved based on time-space trajectory data(CN108597224A)

Hongyu Wu, **Jinzhou Cao**. POI update method based on location check-in data(CN103064953B)

Hongyu Wu, **Jinzhou Cao**. Method for analyzing the quality of crowd-source location data (CN103177189B)

Softwares   Time-space trajectory big data analysis intelligent system(2017SR358941)

POI evaluation update software(2013SR075407)

Weibo data crawled software(2013SR075731)

▬▬▬ CONFERENCE PRESENTATIONS

2021.11   The European Colloquium on Theoretical and Quantitative Geography - ECTQG. Visual Meeting. (Oral presentation)

2019.07   The 4th Space Information Intelligent Service Symposium. Wuhan, China. (Oral presentation)

2018.04   Association of American Geographers Annual Meeting. New Orleans, USA. (Oral presentation)

2016.09   Annual Conference on Theory and Method of Geographic Information Science in China. Shenzhen, China. (Oral presentation)

2016.08   The 33rd International Geographical Congress (IGC). Beijing, China. (Oral presentation)

2015.06   The 14th International Conference on Computers in Urban Planning and Urban Management (CUPUM). Cambridge, MA USA. (Oral presentation)

2014.05	The 13th International Symposium on Web and Wireless GIS (W2GIS). Seoul, South Korea. (Oral presentation)

HONORS and AWARDS

Post-doc	The first Award of National Science and Technology Award in the Surveying and Mapping(Ranked ninth)
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Postgraduate	National Scholarship for Graduate Students, The Ministry of Education(twice,8/300)
	The Top Ten Academic Star for Postgraduates, Wuhan University
	The third Award for National College Student Curricular Academic Science and Technology Works Competition, The Ministry of Education
Undergraduate	Outstanding Graduate, Wuhan University(1/10)
	Second Grade Scholarship(twice)/ Third Grade Scholarship, Wuhan University(once)
	Excellent Student Award(thrice, 5%)
	Outstanding student cadres(twice, 1%)
	First Award for Summer Social Practice and Survey, Wuhan University(1%)

SOCIAL ACTIVITIES

2009.09-2012.06	Minister/Vice Minister of Publicity Department in Student Union, Wuhan University
2011.03-2013.06	Class leader,League branch secretary, Party branch secretary
2009.12-2011.05	Minister of male voice in campus chorus