Curriculum Vitae

Zihan Kan, PhD

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CONTACT INFORMATION

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PROFESSIONAL APPOINTMENTS

Aug 2022 – , **Assistant Professor**, Department of Geography and Resource Management, The Chinese University of Hong Kong.

Jan 2020 – July 2022, **Research Grants Council Postdoctoral Fellow**, Institute of Space and Earth Information Science, The Chinese University of Hong Kong.

Feb 2019 – Aug 2019, **Research Associate**, Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University.

EDUCATION

Sept 2017 – Dec 2018 **Joint Ph.D. Program**

University of Illinois at Urbana-Champaign, USA (Advisor: **Prof. Mei-Po Kwan**)

Sept 2014 – Dec 2019 **Ph.D.** in **Photogrammetry and Remote Sensing**

Wuhan University, China (Advisor: **Prof. Luliang Tang**)

Sept 2010 – Jun 2014 **B.S.** in **Cartography and Geographic Information Engineering**

Wuhan University, China

REARCH INTERESTS

- Geographic Information Science (GIS)
- Geospatial Data Mining
- Spatial Statistics
- Transportation Geography
- Travel Behavior
- Machine Learning
- Environmental Health
- Spatiotemporal Analysis
- Environment Management
- Geovisualization

AWARDS

2021. Advancing Diversity and Inclusion Award, Energy and Environment Specialty Group of the American Association of Geographers

2020. Research Grants Council (RGC) Postdoctoral Fellowship (HK$ 1,215,990), Research Grants Council (PDFS2021-4S08) (Hong Kong)

2019. University Scientific Research Outstanding Achievement Award (Science and Technology). Ministry of Education (China)

2019. Graduate Academic Innovation Award, Wuhan University

2019. Outstanding Doctoral Candidate Scholarship, Wuhan University

2017. First Prize in Progress in Surveying and Mapping Technology. Chinese Society for Geodesy Photogrammetry and Cartography.

2017. National Scholarship, Ministry of Education (China)

2017. Joint Ph.D. Student Program Scholarship, China Scholarship Council

2017. First Class Scholarship, Wuhan University

2016. Second Class Scholarship, Wuhan University

2015. Grand Prize for Outstanding Paper, National Remote Sensing and Geographical Information Science Postgraduate Forum (China)

2015. Kwang-Hua Scholarship, Taiwan Kwang-Hua Education Foundation

2015. First Class Scholarship, Wuhan University

PUBLICATIONS

1. **Kan, Z.**, Kwan, M.P., Ng, M. K., Tieben, H., 2022. The Impacts of Housing Characteristics and Built-Environment Features on Mental Health. International Journal of Environmental Research and Public Health, 19(9): 5143. https://doi.org/10.3390/ijerph19095143
2. **Kan, Z.**, Kwan, M.P., Liu, D., Tang, L., Chen, Y. and Fang M., 2022. Assessing individual activity-related exposures to traffic congestion using GPS trajectory data. *Journal of Transport Geography*, *98*, 103240. https://doi.org/10.1016/j.jtrangeo.2021.103240
3. **Kan, Z.**, Kwan, M.P., Huang, J., Wong, M.S. and Liu, D., 2021. Comparing the space-time patterns of high-risk areas in different waves of COVID-19 in Hong Kong. *Transaction in GIS*. 00, 1– 20. https://doi.org/10.1111/tgis.12800
4. **Kan, Z.**, Kwan, M.P. and Tang, L., 2021. Ripley's K-function for network-constrained flow data. *Geographical Analysis*. 0, 1–20. https://doi.org/10.1111/gean.12300
5. **Kan, Z.**, Kwan, M.P., Wong, M.S., Huang, J. and Liu, D., 2021. Identifying the space-time patterns of COVID-19 risk and their associations with different built environment features in Hong Kong. *Science of the Total Environment*, 772, 145379. https://doi.org/10.1016/j.scitotenv.2021.145379
6. **Kan, Z.,** Wong, M. S., Zhu, R., 2020. Understanding space-time patterns of vehicular emission flows in urban areas using geospatial technique. *Computers, Environment and Urban Systems*, 79, 101399. https://doi.org/10.1016/j.compenvurbsys.2019.101399
7. **Kan, Z.**, Tang, L., Kwan, M.P., Ren, C., Liu, D. and Li, Q., 2019. Traffic congestion analysis at the turn level using taxis' GPS trajectory data. *Computers, Environment and Urban Systems*, 74, 229-243. https://doi.org/10.1016/j.compenvurbsys.2018.11.007
8. **Kan, Z.**, Tang, L., Kwan, M. P. and Zhang, X., 2018. Estimating vehicle fuel consumption and emissions using GPS big data. *International Journal of Environmental Research and Public*

Health, 15(4), 566. https://doi.org/10.3390/ijerph15040566

9. **Kan, Z.**, Tang, L., Kwan, M.P., Ren, C., Liu, D., Pei, T., Liu, Y., Deng, M. and Li, Q., 2018. Fine-grained analysis on fuel-consumption and emission from vehicles trace. *Journal of cleaner production*, 203, 340-352. https://doi.org/10.1016/j.jclepro.2018.08.222
10. Liu, D., Kwan, M.P., **Kan, Z.**, Song, Y. and Li, X., 2022. Racial/Ethnic Inequity in Transit-Based Spatial Accessibility to COVID-19 Vaccination Sites. *Journal of Racial and Ethnic Health Disparities*, 1-9.
11. Liu, D., Kwan, M.P., Huang, J., **Kan, Z.**, Song Y. and Li, X., 2022. Analyzing income-based inequality in transit nodal accessibility. *Travel Behaviour and Society*. *27*, 57-64. https://doi.org/10.1016/j.tbs.2021.11.005
12. Huang, J., Kwan, M.P., Cai, J., Song, W., Yu, C., **Kan, Z**. and Yim, S.H.L., 2022. Field Evaluation and Calibration of Low-Cost Air Pollution Sensors for Environmental Exposure Research. *Sensors*, 22(6), 2381. https://doi.org/10.3390/s22062381
13. Huang, J., Kwan, M.P. and **Kan, Z.**, 2021. The superspreading places of COVID-19 and the associated built-environment and socio-demographic features: A study using a spatial network framework and individual-level activity data. *Health & Place*, 102694. https://doi.org/10.1016/j.healthplace.2021.102694
14. Ren, C., Tang, L., Long, J., **Kan, Z.** and Yang, X., 2021. Modelling place visit probability sequences during trajectory data gaps based on movement history. *ISPRS International Journal of Geo-Information*, 10(7), 456. https://doi.org/10.3390/ijgi10070456
15. Kwok, C.Y.T., Wong, M.S., Chan, K.L., Kwan, M.P., Nichol, J.E., Liu, C.H., Wong, J.Y.H., Wai, A.K.C., Chan, L.W.C., Xu, Y., Li, H., Huang, J. and **Kan, Z.**, 2021. Spatial analysis of the impact of urban geometry and socio-demographic characteristics on COVID-19, a study in Hong Kong. *Science of the Total Environment*, 764, 144455. https://doi.org/10.1016/j.scitotenv.2020.144455
16. Liu, D., Kwan, M.P., **Kan, Z.**, 2021. Analyzing disparities in transit-based healthcare accessibility in the Chicago Metropolitan Area. *Canadian Geographer/Le Géographe canadien*. 1-15. https://doi.org/10.1111/cag.12708
17. Liu, D., Kwan, M.P., **Kan, Z.** and Song, Y., 2021. An integrated analysis of housing and transit affordability in the Chicago Metropolitan Area. *The Geographical Journal*, 187, 110–126. https://doi.org/10.1111/geoj.12377
18. Liu, D., Kwan, M.P. and **Kan, Z.**, 2021. Analysis of urban green space accessibility and distribution inequity in the City of Chicago. *Urban Forestry & Urban Greening*, 59,127029. https://doi.org/10.1016/j.ufug.2021.127029
19. Liu, D., Kwan, M.P. and **Kan, Z.**, 2021. Assessing job-access inequity for transit-based workers across space and race with the Palma ratio. *Urban Research & Practice*, 1-27 https://doi.org/10.1080/17535069.2021.1923795
20. Yu, X., Wong, M.S., Kwan, M.P., Nichol, J.E., Zhu, R., Heo, J., Chan, P.W., Chin, D.C., Kwok, C.Y.T. and **Kan, Z.**, 2021. Covid-19 infection and mortality: Association with PM2.5 concentration and population density—An exploratory study. *ISPRS International Journal of Geo-Information*, 10(3),123. https://doi.org/10.3390/ijgi10030123
21. Fang, M., Tang, L., **Kan, Z.**, Yang, X., Pei, T., Li, Q. and Li, C., 2021. An adaptive Origin-Destination flows cluster-detecting method to identify urban mobility trends. *arXiv preprint* arXiv:2106.05436. https://arxiv.org/abs/2106.05436

22. Chen, Y., Tang, L., **Kan, Z.**, Bilal, M. and Li, Q., 2020. A novel water body extraction neural network (WBE-NN) for optical high-resolution multispectral imagery. *Journal of Hydrology*, 588, 125092. https://doi.org/10.1016/j.jhydrol.2020.125092
23. Cheng, L., Yang, X., Tang, L., Duan, Q., **Kan, Z.**, Zhang, X. and Ye, X., 2020. Spatiotemporal analysis of taxi-driver shifts using big trace data. *ISPRS International Journal of Geo-Information*, *9*(4), 281. https://doi.org/10.3390/ijgi9040281
24. Chen, Y., Tang, L., **Kan, Z.**, Latif, A., Yang, X., Bilal, M. and Li, Q., 2020. Cloud and cloud shadow detection based on multiscale 3D-CNN for high resolution multispectral imagery. *IEEE Access*, 8, 16505-16516. https://doi.org/10.1109/ACCESS.2020.2967590
25. Huang, J., Kwan, M. P., **Kan, Z.** et al. 2020. Investigating the relationship between the built environment and relative risk of COVID-19 in Hong Kong. *ISPRS International Journal of Geo-Information*, 9(11): 624. https://doi.org/10.3390/ijgi9110624
26. Kwok, C.Y.T., Wong, M.S., Li, H., Hui, K.K.W., Ko, F.W.Y., Shiu, H.Y.K. and **Kan, Z.**, 2020. Detection of structural tree defects using thermal infrared imaging. In *40th Asian Conference on Remote Sensing: Progress of Remote Sensing Technology for Smart Future*, ACRS 2019. http://www.scopus.com/inward/record.url?scp=85085665273&partnerID=8YFLogxK
27. Tang, L., Gao, J., Ren, C., Zhang, X., Yang, X. and **Kan, Z.**, 2019. Detecting and evaluating urban clusters with spatiotemporal big data. *Sensors*, *19*(3), p.461. https://doi.org/10.3390/s19030461
28. Tang, L., Sun, F., **Kan, Z.**, Ren, C. and Cheng, L., 2017. Uncovering distribution patterns of high performance taxis from big trace data. *ISPRS International Journal of Geo-Information*, *6*(5), 134. https://doi.org/10.3390/ijgi6050134
29. Tang, L., **Kan,** Z.*, Zhang, X., et al., 2016. A network kernel density estimation for linear features in space–time analysis of big trace data. *International Journal of Geographical Information Science*, 30(9), 1717-1737. (*Corresponding author*). https://doi.org/10.1080/13658816.2015.1119279
30. Tang, L., **Kan, Z.***, Zhang, X., et al., 2016. Travel time estimation at intersections based on low-frequency spatial-temporal GPS trajectory big data. *Cartography and Geographic Information Science*, 43(5), 417-426. (*Corresponding author*). https://doi.org/10.1080/15230406.2015.1130649
31. Tang, L., Yang, X., **Kan, Z.** et al., 2015. Lane-level road information mining from vehicle GPS trajectories based on naïve Bayesian classification. *ISPRS International Journal of Geo-Information*, *4*(4), 2660-2680. https://doi.org/10.3390/ijgi4042660
32. Tang, L., Zhang, X., **Kan, Z.**, Yang, B. and Li, Q., 2014. Spatial data Internet progressive transmission control based on the geometric shapes similarity. *International Journal of Control, Automation and Systems*, *12*(5), 1110-1117. (*Corresponding author*). https://doi.org/10.1007/s12555-012-0484-4
33. Wang, Z., **Kan, Z.***, Hong, J., et al., 2014. Path optimization based on city intersection turning analysis from floating car data. *Applied Mechanics and Materials*, 577, 1055-1060. Trans Tech Publications. (*Corresponding author*). https://doi.org/10.4028/www.scientific.net/AMM.577.1055
34. Tang L., **Kan Z.**, Ren C. et al., 2019. Fine-grained analysis of traffic congestions at the turning level using GPS traces. *Acta Geodaetica et Cartographica Sinica*, *48*(1), 75-85. https://doi.org/10.11947/j.AGCS.2019.20170448
35. Tang, L., **Kan, Z.***, Duan, Q. et al., 2017. A space-time path supported estimation approach for vehicles' fuel-consumption and emissions. *Acta Geodaetica et Cartographica Sinica*, 46(12), 2024-2031. (*Corresponding author*). https://doi.org/10.11947/j.AGCS.2017.20160439

36. Tang, L., **Kan, Z.***, Liu, H., et al., 2017. A kernel density estimation method for linear features in network space. *Acta Geodaetica et Cartographica Sinica*, *46*(1), 107-113. (*Corresponding author*). https://doi.org/10.11947/j.AGCS.2017.20150158
37. Tang L., Duan Q., **Kan, Z.** et al., 2017. Study on identification and space-time distribution analysis of taxi shift behavior. *ISPRS Journal of Geo-Information Science*, 19(2), 167-175. https://doi.org/10.3724/SP.J.1047.2017.00167
38. Tang L., Jin C., Yang X., **Kan. Z.** et al., 2017. Road network topology automatic change detection based on GPS spatio-temporal trajectories. *Geomatics and Information Science of Wuhan University*, *42*(10), 1381-1386. https://doi.org/10.13203/j.whugis20150662
39. Tang, L., **Kan, Z.*,** Huang, F., et al., 2016. Travel time detection at intersection from taxis' trace data. *Geomatics and Information Science of Wuhan University*, 41(1), 136-142. (Corresponding author). https://doi.org/10.13203/j.whugis20130822
40. Liu, H., **Kan, Z.*,** Sun, F., et al., 2016. Taxis' short-term out-of-service behaviors detection using big trace data. *Geomatics and Information Science of Wuhan University*, 41(9), 1192-1198. (Corresponding author). https://doi.org/10.13203/j.whugis20150569
41. Liu, H., **Kan, Z**., Wu, H. et al., 2016. Vehicles' refueling activity modeling and space-time distribution analysis. *Bulletin of Surveying and Mapping*, 9, 29-34. https://doi.org/10.13474/j.cnki.11-2246.2016.0286
42. Tang, L., Yang, X., **Kan, Z**. et al., 2016. Traffic lane numbers detection based on the naive Bayesian classification. *China Journal of Highway and Transport*, *29*(3), 116-123. https://doi.org/10.3969/j.issn.1001-7372.2016.03.015
43. Tang L., Liu Z., Yang X., **Kan Z.** et al., 2016. A method of spatio-temporal trajectory fusion and road network generation based on cognitive law. *Acta Geodaetica et Cartographica Sinica*, 44(11), p.1271. https://doi.org/10.11947/j.AGCS.2015.20140591
44. Huang L., **Kan, Z.** and Li D., 2015. Design and realization of 3d electronic map based on time and space base state correction. *Geospatial Information*, 34(1), 311-315. https://doi.org/10.3969/j.issn.1672-4623.2015.01.055

PRESENTATIONS

1. **Kan, Z.** Exploring the Space-Time Patterns of COVID-19 Transmission Risk and Their Associations with Different Built Environment Factors in Hong Kong. *Annual Meeting of American Association of Geographers (Online)*, Seattle, WA. 2021
2. **Kan, Z.** Traffic Congestion Analysis at the Turn Level Using Taxis' GPS Trajectory Data. *International Conference on Urban Informatics*, Hong Kong Polytechnic University, Hong Kong. 2019
3. **Kan, Z.** Estimating and Visualizing Vehicles' Fuel Consumption/ Emissions from GPS Trace Big Data Based on Activity Analysis. *Annual Meeting of American Association of Geographers*, New Orleans, LA. 2018
4. **Kan, Z.** Identify Refueling/Fuel Consumption and Estimating Emissions by Spatial-Temporal GIS. *Conference of Asia GIS*, Hong Kong University, Hong Kong. 2017
5. **Kan, Z.** A Space-Time Path Supported Approaches for Fuel Consumption/Emissions Estimation. *Annual Meeting of Theories and Methods of Geographic Information Science*. Shenzhen, China. 2016

PARTICIPATED PROJECTS

2021 – 2024. Deploying Geospatial Big Data and Real-time Mobile Sensing to Assess the Health Impacts of Individual Exposure to Green/blue Spaces, Light at Night, Air Pollution, and Noise (GLAN). Funded by *Hong Kong Research Grants Council Collaborative Research Fund (US$753,420)*.

2021 – 2023. Evaluating Individual Exposure to Noise and Air Pollution Using GPS and Mobile Sensors. Funded by *Hong Kong Research Grants Council General Research Fund (US$154,660)*. Project Coordinator

2020. Study on the Possible Use of Mobile Applications and Big Data in the Travel Characteristics Survey. Funded by *Hong Kong Transport Department (US$ 38,574)*.

2018 – 2021. Jockey Club Smart City Tree Management Project. Funded by *The Hong Kong Jockey Club Charities Trust (US$ 4,149,787)*.

2016 – **2020.** Human Behavior Patterns Mining and Quantitative Space Optimization Based on Crowdsourcing Trajectory Big Data. Funded by the *National Natural Science Foundation of China (US$ 101,678)*.

2016 – **2019.** Precise Road Data Mining and Change Detecting Based on GPS Trajectories. Funded by the *National Natural Science Foundation of China (US$ 149,858)*.

2013 – **2016.** Experiencing Knowledge Acquisition and Space-Time Modeling Based on Floating Car Data. Funded by the *National Natural Science Foundation of China (US$ 117,321)*.

TEACHING

Teaching Assistant. *Climate Change and Society* (LSGI 1B02). Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University (Summer, 2019)

Teaching Assistant. *Space-Time Analysis in GIS – Transportation* (201404239), State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing Wuhan University (Fall, 2016)

INVITED TALKS

2021. **Guest Speaker.** Exploring Human-Environment Interactions for Sustainable City Development: A Geospatial Data Analytical Approach. *Research Seminar of Department of Geography and Resource Management, The Chinese University of Hong Kong*. Hong Kong.

2021. **Guest Speaker**. Research on the space-time pattern of COVID-19 transmission and associated built environment characteristics in Hong Kong. *Institute of Space and Earth Information Science (ISEIS) Seminar*. The Chinese University of Hong Kong

2016. **Guest Speaker**. Analyzing Dynamics of Urban Network Using Trajectory Data. *School of Remote Sensing and Information Engineering Seminar*. Wuhan University.

2015. **Guest Speaker**. Acquisition of Spatiotemporal Big Trajectory Data and Study of

Urban Dynamics. *School of Resource and Environmental Science Seminar*. Wuhan University.

PROFESSIONAL SERVICES

Guest Editor:

Special Issue "Geospatial Data and Methods for Sustainable Mobility and Urban Accessibility" in *Sustainability*

Manuscript Reviewer:

Geographical Analysis, International Journal of Geographical Information Science, Cartography and Geographic Information Science, Transportation Research Part C: Emerging Technologies, PLOS One, Transactions in GIS, Applied Geography, Journal of Transport Geography, Future Generation Computer Systems, IEEE Access, IEEE Transactions on Intelligent Transportation Systems, IEEE Transactions on Computational Social Systems, Journal of Intelligent Transportation Systems: Technology, Planning, and Operations, Physica A: Statistical Mechanics and its Applications, Science of the Total Environment, Atmosphere

Conference Session:

1. **Organizer**, Mobile Sensing and Spatiotemporal Analysis of Human Behavior and Environmental Health, A*nnual Meeting of American Association of Geographers* (*Online*), February 2022, New York.
2. **Chair**, Spatial Context, Human Activities and Space-Time Transmission of COVID-19, *Annual Meeting of American Association of Geographers* (*Online*), April 2021, Seattle, WA.
3. **Organizer**, Spatializing Social Injustice, *Annual Meeting of American Association of Geographers* (*Online*), April 2021, Seattle, WA.
4. ***Session Convener***, Spatiotemporal Behavior and Environmental Health Perception, *16th Space Behavior and Planning Research Conference (Online)*, December 2020, Xiamen, China.