

Wei Kang

ASSISTANT PROFESSOR · DEPARTMENT OF GEOGRAPHY AND THE ENVIRONMENT

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Education

Arizona State University

Tempe, AZ

PHD GEOGRAPHY

Aug 2014 - May 2018

- Committee: Sergio Rey (chair), Stewart Fotheringham, Xinyue Ye
- Dissertation Title: Issues in the Distribution Dynamics Approach to the Analysis of Regional Economic Growth and Convergence: Spatial Effects and Small Samples

Peking University

Beijing, China

MS CARTOGRAPHY AND GIS

Sept 2011 - Jun 2014

- Advisor: Dr. Yuefeng Liu
- Thesis Title: An Atomic Model of Spatiotemporal Query and Its Implementation Method Based on Object-Oriented Snapshot Model

Wuhan University

Wuhan, China

BS GEOGRAPHIC INFORMATION SYSTEM

Sept 2007 - Jun 2011

- Thesis advisor: Dr. Wenping Jiang
- Thesis Title: Spatial Cognitive Research of 3D Map Scene

Current Academic Appointments

2022-
present **Assistant Professor**, Department of Geography and the Environment, Courtesy Faculty in the Department of Computer Science and Engineering, University of North Texas

2023-
present **Affiliate Faculty**, Center for Open Geographical Science, San Diego State University

2023-
present **Affiliate Faculty**, Center for Geospatial Sciences, University of California Riverside

Prior Academic Appointments

2020-2022 **Research Scientist**, Inland Center for Sustainable Development, School of Public Policy, University of California Riverside

2018-2020 **Postdoctoral Scholar**, Center for Geospatial Sciences, University of California Riverside

Editorial Appointments

2023-
present **Editorial Board Member**, Computers, Environment and Urban Systems

Research Grants

2023-2024	Identifying the Effect of Housing policy on Mental Health Outcomes Among Low-Income Renters and their Children During the COVID-19 Pandemic , Co-Principal Investigator. Sponsor: California Department of Public Health	\$200,000
2023-2024	Fair Housing Reforms in Low Income Housing Tax Credits: An investigation of implications for neighborhoods and communities in the DFW region , Principal Investigator. Sponsor: Univeristy of North Texas	\$10,000
2022-2025	Forced Displacement and Community Resilience: Housing Insecurity under COVID-19 in Inland Southern California (#2151970) , Co-Principal Investigator. Sponsor: National Science Foundation	\$336,050
2017-2020	Neighborhoods in Space-Time Contexts (#1762160) , Coauthor, Contributor. Sponsor: National Science Foundation	\$319,630

Publications

REFEREED JOURNAL ARTICLES

- 2023 Oselin, S., J. Ross, Q. Wang, and **W. Kang**. "Fair Chance Act Failures? Employers' Hiring of People with Criminal Records." *Criminology & Public Policy*.
- 2023 Hatch, E., C. Wang, **W. Kang**, B. Karna, N. Sabinsky, and K. Ferguson. "Geographies of Opportunity for Youth Across the Contiguous United States." *Professional Geographers*.
- 2023 Wang, Q., **W. Kang**. "Small Businesses and Government Assistance during COVID-19: Evidence from the Paycheck Protection Program in the U.S." *Environment and Planning A: Economy and Space*.
- 2023 Luo, W., Y. Zhou, Z. Liu, **W. Kang**, S. He, R. Zhu, R. Li, and B. Huang. "Cross-regional analysis of the association between human mobility and COVID-19 infection in Southeast Asia during the transitional period of "living with COVID-19"." *Health & Place*.
- 2022 **Kang, W.**, Q. Wang. "The impact of COVID-19 on small businesses in the U.S.: A longitudinal study from a regional perspective." *International Regional Science Review*.
- 2022 Rey, S. J., L. Anselin, P. Amaral, D. Arribas-Bel, R. X. Cortes, J. D. Gaboardi, **W. Kang**, E. Knaap, Z. Li, S. Lumnitz, T. M. Oshan, H. Shao, L. J. Wolf. "The PySAL ecosystem: philosophy and implementation." *Geographical Analysis*, 54(3): 467-487.
- 2022 **Kang, W.**, E. Knaap, S.J. Rey. "Changes in the economic status of neighborhoods in U.S. metropolitan areas from 1980 to 2010: stability, growth, and polarization." *Urban Studies*, 59(13): 2774-2800.
- 2021 Wang, Q., **W. Kang**. "What Are the Impacts of COVID-19 on Small Businesses in the U.S.? Early Evidence based on the Largest 50 MSAs." *Geographical Review*.
- 2021 Yousif, A., K. Ibrahim, **W. Kang**, W.Z.W. Zin. "Robust empirical Bayes approach for Markov chain modeling of air pollution index." *Journal of Environmental Health Science and Engineering*, 19(1): 343-356.
- 2021 **Kang, W.**, S.J. Rey. "Smoothed Estimators for Markov Chains with Sparse Spatial Observations." *Geographical Analysis*, 53(2): 307-328.
- 2021 Wei, R., T. H. Grubestic, **W. Kang**. "Spatiotemporal patterns of alcohol outlets and violence: A Spatially Heterogeneous Markov Chain Analysis." *Environment and Planning B: Urban Analytics and City Science*, 48(8): 2151-2166.
- 2020 **Kang, W.**, S. J. Rey, L. J. Wolf, E. Knaap, S. Y. Han. "Sensitivity of Sequence Methods in the Study of Neighborhood Change in the United States." *Computers, Environment and Urban Systems*, 81.
- 2020 **Kang, W.**, S.J. Rey. "Inference for Income Mobility Measures in the Presence of Spatial Dependence." *International Regional Science Review*, 43(1-2): 10-39.
- 2020 Shao, H., W. Li, **W. Kang**, S. J. Rey. "When PySAL Meets CI: Towards an Interoperable and Replicable Cyberinfrastructure for Online Spatial-Statistical-Visual Analytics." *Journal of Geovisualization and Spatial Analysis*, 4(2): 1-16.
- 2020 Rey, S. J., S. Y. Han, **W. Kang**, E. Knaap, R. X. Cortes. "A Visual Analytics System for Space-Time Dynamics of Regional Income Distributions Utilizing Animated Flow Maps and Rank-based Markov Chains." *Geographical Analysis*, 52(4): 537-557.

- 2020 Lumnitz, S., D. Arribas-Bell, R.X. Cortes, J. Gaboardi, V. Griess, **W. Kang**, T. Oshan, L. Wolf, S. Rey. “‘splot’ - visual analytics for spatial statistics.” *Journal of Open Source Software*, 5(47): 1882.
- 2020 Yousif, A., K. Ibrahim, **W. Kang**, W. Z. W. Zin. “Modeling the Spatio-Temporal Dynamics of Air Pollution Index Based on Spatial Markov Chain Model.” *Environmental Monitoring and Assessment*, 192(11): 1–24.
- 2019 Yousif, A., K. Ibrahim, **W. Kang**, W. Z. W. Zin. “Markov Chain Modeling for Air Pollution Index Based on Maximum A Posteriori Method.” *Air Quality, Atmosphere and Health*, 12: 1521-1531.
- 2019 Organizers, **W. Kang**, T. Oshan, L. J. Wolf, Discussants, G. Boeing, V. Frias-Martinez, S. Gao, A. Poorthuis, W. Xu. “A roundtable discussion: Defining urban data science.” *Environment and Planning B: Urban Analytics and City Science*, 46(9):1756–1768.
- 2019 Han, S. Y., S. Rey, E. Knaap, **W. Kang**, L. J. Wolf. “Adaptive choropleth mapper: An open-source web-based tool for synchronous exploration of multiple variables at multiple spatial extents.” *ISPRS International Journal of Geo-Information*, 8(11).
- 2019 Oshan, T., Z. Li, **W. Kang**, L. J. Wolf, A. S. Fotheringham. “MGWR: A Python Implementation of Multiscale Geographically Weighted Regression for Investigating Process Spatial Heterogeneity and Scale.” *ISPRS International Journal of Geo-Information*, 8(6).
- 2019 Oshan, T., L. J. Wolf, A. S. Fotheringham, **W. Kang**, Z. Li, H. Yu. “A comment on geographically weighted regression with parameter-specific distance metrics.” *International Journal of Geographical Information Science*, 33(7): 1289-1299.
- 2019 Yu, H., A. S. Fotheringham, Z. Li, T. Oshan, **W. Kang**, L. J. Wolf. “Inference in Multiscale Geographically Weighted Regression.” *Geographical Analysis*, 52(1): 87-106.
- 2019 Rey, S. J., **W. Kang**, L. J. Wolf. “Regional Inequality Dynamics, Stochastic Dominance, and Spatial Dependence.” *Papers in Regional Science*, 98(2): 861-881.
- 2018 **Kang, W.**, S. J. Rey. “Conditional and Joint Tests for Spatial Effects in Discrete Markov Chain Models of Regional Income Distribution Dynamics.” *The Annals of Regional Science*, 61(1): 73-93.
- 2017 Fotheringham, A. S., W., Yang, **W. Kang**. “Multiscale Geographically Weighted Regression (MGWR).” *Annals of the American Association of Geographers*, 107(6): 1247–1265.
- 2016 Rey, S. J., **W. Kang**, L. J. Wolf. “The Properties of Tests for Spatial Effects in Discrete Markov Chain Models of Regional Income Distribution Dynamics.” *Journal of Geographical Systems*, 18(4): 377–3985.
- 2015 Liu, Y., **W. Kang**. “An Atomic Model of Spatiotemporal Query Based on Object-Oriented Snapshot Model.” *Acta Scientiarum Naturalium Universitatis Pekinensis*, 51(4): 755-762.
- 2014 Liu, Y., R. Si, **W. Kang**. “Research on the Complex Structural Properties of Urban Taxi Passenger Flow Network.” *Acta Scientiarum Naturalium Universitatis Pekinensis*, 50(5): 873-879.

BOOK CHAPTERS

- 2022 **Kang, W.** “Spatial Dynamics.” *Handbook of Spatial Analysis in the Social Sciences*, Rey, S. J., and R. Franklin (eds.) Edward: Elgar Cheltenham.
- 2020 **Kang, W.** “PySAL and Spatial Statistics Libraries.” *The Geographic Information Science & Technology Body of Knowledge (3rd Quarter 2020 Edition)*, John P. W. (eds.)

CONFERENCE PROCEEDINGS

- 2018 Rey, S. J., E. Knaap, S. Han, L. J. Wolf, and **W. Kang**. “Spatio-temporal analysis of socioeconomic neighborhoods: The Open Source Longitudinal Neighborhood Analysis Package (OSLNAP).” *Proceedings of the 17th Python in Science Conference (SciPy 2018)*: 121-128.

TECHNICAL REPORTS

- 2022 **Kang, W.**, Y. White. “Overcrowdedness, Housing Insecurity, and COVID-19: The Case of Inland Southern California.” UCR Inland Center for Sustainable Development.
- 2022 **Kang, W.**, Y. White. “Housing Affordability in Riverside and San Bernardino Counties.” UCR Inland Center for Sustainable Development.

- 2021 **Kang, W.**, K. Kopko. "Living with the COVID-19 Pandemic for a Year: The Exacerbated Housing Insecurity Issue." UCR Inland Center for Sustainable Development.
- 2020 **Kang, W.**, K. Kopko. "Housing Insecurity & the COVID-19 Pandemic." UCR Inland Center for Sustainable Development.
- 2020 **Kang, W.**, K. Kopko. "Economic Impacts of COVID-19 on Small Businesses in the Inland Region." UCR Inland Center for Sustainable Development.

Presentations

CONFERENCE PARTICIPATION AND PRESENTATIONS

- 2023 (Presenter) **Kang, W.**, and T. Oshan. "Multicollinearity in Multiscale Geographically Weighted Regression (MGWR)." 70th Annual North American Meetings of the Regional Science Association International. San Diego, CA. November.
- 2023 (Presenter) Wang, Q., **W., Kang.** "Government Assistance and Small Businesses in Underserved Communities: Evidence from the Paycheck Protection Program in the U.S." The 62nd Annual Meeting of the Western Regional Science Association. Big Island, HI. February.
- 2022 (Organizer) "Sessions on Spatial Data Science for Impact: Advances in open source, open science frameworks, methods, applications, and infrastructures for the public good." Association of American Geographers. New York, NY. Feb 25-Mar 1.
- 2021 (Organizer) "Sessions on Urban Data Science: Methods & Models for our Changing Cities." Association of American Geographers. Virtual Conference. April.
- 2020 (Organizer) "Sessions on Urban Data Science: Methods & Models for our Changing Cities." Association of American Geographers. Denver, CO. April.
- 2020 (Collaborator) Wei, R., T. H. Grubestic, and **W. Kang.** "Spatiotemporal patterns of alcohol outlets and violence: A Markov Chain Analysis." Western Regional Science Association 59th Annual Meeting. Waikiki, HI. March.
- 2019 (Presenter) **Kang, W.**, and S. J. Rey. "A New Optimal Matching Approach to Uncovering Neighborhood Sequencing Structure." 66th Annual North American Meetings of the Regional Science Association International. Pittsburgh, PA. November.
- 2019 (Presenter) **Kang, W.**, and S. J. Rey. "Urban income mobility as a multifaceted concept in the United States." Association of American Geographers. Washington, DC. April.
- 2019 (Collaborator) Rey, S.J., and **W. Kang.** "Spatial Inequality, Mobility, and Equalization Dynamics for U.S. Metropolitan Areas 1970-2010." Association of American Geographers. Washington, DC. April.
- 2019 (Organizer, Chair) "Sessions on Methods and Motivations for Measuring Spatial Inequality & Socioeconomic Mobility." Association of American Geographers. Washington, DC. April.
- 2019 (Organizer, Chair) "Sessions on Urban Data Science: Methods & Models for our Changing Cities." Association of American Geographers. Washington, DC. April.
- 2019 (Collaborator) **Kang, W.**, S.J. Rey, L.J. Wolf, E. Knaap, and S. Han. "Fishing for neighborhood trajectory patterns in the United States - a comparison of sequence analysis methods." The 58th Annual Meeting of Western Regional Science Association. Napa Valley, CA. February.
- 2018 (Presenter) **Kang, W.**, S. J. Rey, L. J. Wolf, E. Knaap, and S. Han. "Fishing for neighborhood trajectory patterns - a comparison of sequence analysis methods." 65th Annual North American Meetings of the Regional Science Association International. San Antonio, TX. November.
- 2018 (Collaborator) Rey, S.J., E. Knaap, S. Han, L. Wolf, and **W. Kang.** "Spatio-temporal Analysis of Socioeconomic Neighborhoods: The Open Source Longitudinal Neighborhood Analysis Package (OSLNAP)." Scientific Computing with Python. Austin. July.
- 2018 (Organizer, Chair, Panelist) "Symposium on Integrating Spatial Statistics within Open Source & Open Science." Association of American Geographers. New Orleans, LA. April.
- 2018 (Presenter) **Kang, W.** and S.J. Rey. "Smoothed Estimators for Markov Chains with Sparse Spatial Observations." Association of American Geographers. New Orleans, LA. April.
- 2018 (Presenter) **Kang, W.** and S.J. Rey. "Assessing performance of global and local indicators of mobility association under spatial autocorrelation." The 57th Annual Meeting of Western Regional Science Association. Pasadena, CA. February.

- 2017 (Presenter) **Kang, W.** and S.J. Rey. "Regional income mobility and spatial dependence." 64th Annual North American Meetings of the Regional Science Association International. Vancouver, BC. November.
- 2017 (Presenter) Rey, S.J., X. Ye and **W. Kang.** "Spatial economic inequality dynamics in China, 1978-2012." Association of American Geographers. Boston, MA. April.
- 2017 (Presenter) **Kang, W.** and S.J. Rey. "Regional income mobility and spatial dependence." Western Regional Science Association 56th Annual Meeting. Santa Fe, NM. February.
- 2016 (Collaborator) Rey, S.J., **W. Kang** and L.J. Wolf. "Regional inequality dynamics, stochastic dominance, and spatial dependence." The 63th Annual North American Meetings of the Regional Science Association International. Minneapolis, Minnesota. November
- 2016 (Presenter) **Kang, W.** and S.J. Rey. "Spatial effects in Solow growth model - a simulation analysis." Association of American Geographers. San Francisco, CA. April.
- 2016 (Presenter) **Kang, W.** and S.J. Rey. "A comparison of tests for spatial effects in discrete Markov chain models of regional income distribution dynamics." The 55th Annual Meeting of Western Regional Science Association. Waikoloa, HI. February.
- 2015 (Collaborator) Rey, S.J., **W. Kang**, and L.J. Wolf. "Properties of tests for spatial effects in discrete Markov chain models of regional income distribution dynamics." 62th Annual North American Meetings of the Regional Science Association International. Portland. November.
- 2015 (Presenter) Rey, S.J., **W. Kang**, and L.J. Wolf. "Properties of tests for spatial effects in discrete Markov chain models of regional income distribution dynamics." Scientific Computing with Python. Austin. July.
- 2012 (Presenter) **Kang, W.** "Preliminary Analysis of Spatial Cognition Characteristics under Ubiquitous Mapping Environment." ICA Workshop on Ubiquitous Mapping. The University of Tokyo, Japan. July.

INVITED TALKS

- Fall 2022. "Advancing & Integrating Open Source Spatial Data Science to Promote Equitable Regions and Policies." Academic Forum in Spatial Analytics and Spatial Statistics hosted by China University of Mining and Technology College of Environment and Geomatics.
- Spring 2022. "Sequence Methods in the Study of Neighborhood Change." University of Toledo.
- Spring 2022. "Sequence Methods in the Study of Neighborhood Change." University of Arkansas.
- Spring 2022. "Advancing & Integrating Open Source Spatial Data Science to Promote Equitable Regions and Policies." University of North Texas.
- Spring 2022. "Sequence Methods in the Study of Neighborhood Change." Virginia Tech.
- Fall 2021. "Sequence Methods in the Study of Neighborhood Change." University of Chicago.
- Spring 2019. "Space-Time Statistics for Economic Inequality Dynamics." University of Arizona.
- Spring 2019. "Space-Time Statistics for Economic Inequality Dynamics." University of Tennessee, Knoxville.
- Spring 2017. "Spatial dynamics: Markov methods." Arizona State University.

Courses Taught

SHORT AND INVITED COURSES

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| 2019 | Spatial Data Science with PySAL (Python Spatial Analysis Library) , Co-Instructor | <i>Pittsburgh, PA</i> |
| 2018 | Spatial Data Science with PySAL (Python Spatial Analysis Library) , Co-Instructor | <i>San Antonio, TX</i> |
| 2017 | Spatial Data Science with PySAL (Python Spatial Analysis Library) , Co-Instructor | <i>Vancouver, BC</i> |

UNIVERSITY OF NORTH TEXAS

Fall 2022	GEOG 5560 - Application Development with Python Programming , Instructor	<i>Denton, TX</i>
Spring 2023	GEOG 5550 - Advanced Geographic Information Systems , Instructor	<i>Denton, TX</i>
Spring 2023	GEOG 4560 - Introduction to Python Programming , Instructor	<i>Denton, TX</i>
Fall 2023	GEOG 5560 - Application Development with Python Programming , Instructor	<i>Denton, TX</i>

ARIZONA STATE UNIVERSITY

Fall 2014	Statistics for Geographers , Graduate Teaching Assistant	<i>Tempe, AZ</i>
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Mentoring

2023-2024	Matthew Huizar, Undergraduate in GIS+CS, UNT , Mentor for the Undergraduate Research Fellowship	<i>Denton, TX</i>
2022-2024	Injal Bhattarai, Master Student in Geography, UNT , Committee Member	<i>Denton, TX</i>
2020-	John South, PhD Student in Environmental Science, UNT , Committee Member	<i>Denton, TX</i>
2021-2023	Noah Ray, Master Student in Geography, UNT , Committee Member	<i>Denton, TX</i>
2019-2023	Michael Biancardi, Undergraduate Student in Computer Science, UNT , Honor thesis Committee Member	<i>Denton, TX</i>
2021-2023	Kaitlin Stewart, Master Student in Geography, UNT , Committee Member	<i>Denton, TX</i>
2021-2023	Shwarnali Bhattacharjee, Master Student in Geography, UNT , Committee Member	<i>Denton, TX</i>

Outreach & Professional Development

SERVICE AND OUTREACH

2019-2022	AAG Spatial Analysis and Modeling Specialty Group , Board Member
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CERTIFICATES

2021	Framework for Data Collection and Analysis , Coursera
2020	DeepLearning.AI TensorFlow Developer Professional Certificate , Coursera
2019	Neural Networks and Deep Learning , Coursera
2019	Machine Learning , Coursera

OPEN SOURCE PYTHON PACKAGE DEVELOPMENT

PySAL: Open source python spatial analysis library for geospatial data science.

giddy: Open source Python package for exploratory spatiotemporal data analysis and the analysis of geospatial distribution dynamics.

mgwr: Open source Python package for the calibration and inference of multiscale geographically weighted regression.

pointpats: Open source Python package for statistical analysis of planar point patterns.

geosnap: Open source Python package for the exploration, modeling, analysis, and visualization of the social and spatial dynamics of neighborhoods.

cenpy: A python interface to explore and query the U.S. Census API.

JOURNAL REFEREE

Annals of the American Association of Geographers, Annals of Regional Science, Applied Spatial Analysis and Policy, Arabian Journal of Geosciences, Cartography and Geographic Information Science, Computational Urban Science, Environment and Planning A: Economy and Space, Environment and Planning B: Urban Analytics and City Science, Forests, Geographical analysis, Global Environmental Change, Housing Policy Debate, Human Geography, International Journal of Geographical Information Science, International Regional Science Review, Journal of Planning Education and Research, Papers in Regional Science, Socio-Economic Planning Sciences, The Annals of Regional Science, The Journal of Open Source Software

PROFESSIONAL ASSOCIATIONS

Association of American Geographers
Regional Science Association International
Spatial Econometrics Association

Service to University and Community

DEPARTMENT

2022-2024 **UNT Geography Department Graduate Studies Committee**, Member *Denton, TX*
2023-2024 **UNT Geography Department Strategic Planning Committee**, Member *Denton, TX*

UNIVERSITY

2023- **UNT CAS IT Computing Committee**, Member *Denton, TX*
2019 **UCR GIS Day Planning Committee**, Member *Riverside, CA*