

Avipsa Roy, Ph.D.*Assistant Professor*

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 Spatial Temporal Data Science Lab (STaNCe Lab)
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EDUCATION	Ph.D. in Geography, Arizona State University , School of Geographical Sciences and Urban Planning, Tempe, AZ, USA. 2017-2021
	M.Sc. in Geoinformatics, University of Muenster , Institute for Geoinformatics, Muenster, Germany. 2015-2017
	B.Sc. in Computer Science, University of Calcutta , St. Xavier's College, Kolkata, India. 2007-2011
EMPLOYMENT & AFFILIATIONS	Assistant Professor University of California, Irvine July 2021 - Present
	NSF-ORISE Mathematical Sciences Graduate Intern Oak Ridge National Laboratory, USA 2020
	DOE Graduate Research Intern Los Alamos National Laboratory, USA. 2018-2019
	Graduate Research Intern & Thesis Student Analytics Group, IBM Research, and Development, Germany. 2015-2016
	Software Engineer Siebel - CRM Analytics Group, Accenture, India. 2013-2015
	Technical Analyst - CRM Oracle Cloud CRM Group, Cognizant, India. 2010-2013
PEER-REVIEWED PUBLICATIONS	J1. Roy A, Nelson TA, Turaga P. "Functional data analysis approach for mapping change in time series: A case study using bicycling ridership patterns", <i>Transportation Research Interdisciplinary Perspectives</i> (2023). https://doi.org/10.1016/j.trip.2022.100752
Journal Articles Published	J2. Roy A, Casleton E, Fairchild G et al. "Joint segmentation of aerial UAV and LiDAR images using Bayesian non-parametric clustering". Preprint on techrxiv. (Resubmitted to, ACM Transactions on Knowledge Discovery from Data. upon review by John Krumm, Microsoft Research) (2023). https://doi.org/10.36227/techrxiv.18585356.v1
	J3. Roy A., Kar B. "Effect of social vulnerability on taxi trip times during hurricane Sandy", <i>Transport Findings</i> (2022). https://doi.org/10.32866/001c.53070
	J4. Nelson TA, Ferster CJ, Roy A., Winters M. "Bicycle streetscapes: a data-driven approach to mapping streets based on bicycle usage", <i>International Journal of Sustainable Transportation</i> (2022). (I.F: 4.36) https://doi.org/10.1080/15568318.2022.21
	J5. Roy A., Law M*. "Examining spatial disparities in electric vehicle charging station placements using machine learning", <i>Sustainable Cities & Society</i> (2022) (I.F:10.69) https://doi.org/10.1016/j.scs.2022.103978
	J6. Roy A., Fuller D, Nelson TA and Kedron P. "Assessing the role of geographic context in transportation mode detection from GPS data", In <i>Journal of Transport Geography</i> (2022). (I.F: 5.89) https://doi.org/10.1016/j.jtrangeo.2022.103330
	J7. Roy A., Kar B. "A multicriteria decision analysis framework to measure equitable healthcare access during COVID-19", In <i>Journal of Transport & Health</i> (2022). (I.F: 3.61) https://doi.org/10.1016/j.jth.2022.101331
	J8. Nelson TA, Roy A., et al. "A Generalized Model for Mapping Bicycle Ridership with Crowdsourced Data", In <i>Transportation Research Part C: Emerging Technologies</i> (2021). (I.F.: 9.02) https://doi.org/10.1016/j.trc.2021.102981
	J9. Roy A., Fuller D, Stanley K, Nelson T. "Classifying Transportation Modes from Global Positioning Systems and Accelerometer data: A Machine Learning Approach". In <i>Transport Findings</i> (2020). https://doi.org/10.32866/001c.14520
	J10. Roy, A., Nelson, TA, Fotheringham, SA and Winters, M. "Correcting Bias in Crowdsourced Data to Map Bicycle Ridership of All Bicyclists." In <i>Urban Science</i> (2019). https://doi.org/10.3390/urbansci3020062
	J11. Law M*, Roy A. "A geospatial data fusion framework to quantify variations in electric vehicle charging demand", In <i>Proceedings of the 4th ACM SIGSPATIAL International Workshop on Advances on Resilient and Intelligent Cities</i> (2021). https://doi.org/10.1145/3486626.3493429
	J12. Roy A and Kar B. "Characterizing the Spatio-Temporal Spread of COVID-19 from Human Mobility Patterns and Sociodemographic Indicators". In <i>Proceedings of the 3rd ACM SIGSPATIAL International Workshop on Advances on Resilient and Intelligent Cities</i> (2020). https://doi.org/10.1145/3423455.3430303
	J13. Roy A., Fouché E, Morales RR, and Möhler G. "In-Database Geospatial Analytics using Python." In <i>Proceedings of the 2nd ACM SIGSPATIAL International Workshop on Advances on Resilient and Intelligent Cities</i> (2019). https://doi.org/10.1145/3356395.3365598

J14. Roy, A, and Pebesma, E. "A Machine Learning Approach to Demographic Prediction using Geohashes." In *Proceedings of the 2nd International Workshop on Social Sensing* (2017). <https://doi.org/10.1145/3055601.3055603>

J15. “Quantifying the spatial distribution variations of in sheltered homelessness across different socioeconomic groups during COVID-19: A case study in Los Angeles” – Research Report for Haynes Foundation, Shengxiang Jin and Avipsa Roy. (2023)

Currently Under Review

J16. Law M, Chen T, **Roy A,** Casleton EJ. “Understanding the role of geographic factors and fluid injection on induced seismicity using spatial analytics”. To be submitted, *Nature Scientific Reports* (2023).

J17. Chung CE, Law M, **Roy A.** “Exploring the relationship of bicycling ridership with existing infrastructure for bicyclists in Southern California: A planning perspective”. To be submitted, *Journal of Transport Geography* (2023).

J18. Roy, A. “Data and Technology aspects of Active Transportation Planning”. Submitted, *Journal of American Planning Association* (2023).

J19. Zheng H., Dong Z., Jin S., **Roy A.** “Understanding the effects of socioeconomic disparities on changes in housing price appreciation with explainable AI”. Submitted, *Environment and Planning Part B: Urban Analytics & City Science* (2023).

J20. “A perspective on the long-term impacts of artificial general intelligence on humanistic thought”, *New York Times Technical Perspectives*, Avipsa Roy (Submitted).

J21. Exploring the relationship of bicycling ridership with existing infrastructure for bicyclists in Southern California: A planning perspective, *Transport Policy*, Case E Chung & Avipsa Roy. (2024)

Manuscripts In Preparation

J22. “Digital ethics of a tech-savvy world: The other side of academia”; Avipsa Roy (Book Draft) *Harvard University Press*. (Draft Due: Winter 2025)

J23. “Entropy and its role in the social phenomenon of transportation accessibility”, Avipsa Roy et al. (*Science Advances AAAS*) (2024)

J24. “Data and technology aspects of active transportation planning”, *Journal of Transport Geography*, Avipsa Roy. (2024)

J25. “Role of ethics in data-driven active transportation planning: A theoretical framework”, *Transportation Research Part A: Policy & Practice*, Avipsa Roy. (2024)

J26. “The usefulness of green spaces in active transportation utilization in Orange County, California, USA.”, *Journal of American Planning Association*. (2024).

GRANTS & FELLOWSHIPS

- **NCAR NSF Early Career Innovator (Solo PI) (\$250k) In-Preparation** 2024-26
- **NSF grants pending/declined (~\$1.9 million)** 2021-24
- **METRANS PSR UTC Region 9 CalTrans Task Order 3469 (No-cost Extension) as Sole PI (\$100k)** 2024-25
- **California Senate Bill 1 Statewide Transportation Research Program (Role: PI)**, Research Grant funded through University of California Institute of Transportation Studies on “Providing Californians with equitable access to electric vehicles – An application to SCAG region” (**\$96,000**) 2022-24
- **California Senate Bill 1 Statewide Transportation Research Program (Role: PI)**, Research Grant funded through University of California Institute of Transportation Studies on “Reassessing traffic safety: Conditions and causes of dangerous streets and their implications for racial justice.” (**\$80,000**) 2022-24
- **CalTrans Division of Research, Innovation and System Information (Role: PI)**, Research Grant funded through Pacific Southwest Region University Transportation Center on “Developing a data fusion framework to map active transportation usage patterns in Orange County” (**\$75,000**) 2022-23
- **Faculty Research Grant** Academic Senate Council on Research, Computing, and Libraries (**CORCL**), University of California Irvine (**\$2,000**) 2021
- **John Randolph and Dora Haynes Foundation Faculty Fellowship** for research on “Characterizing the spread of COVID-19 using housing affordability metrics from crowdsourced data” (**\$17,600**) 2021
- **Interim COVID-19 Recovery Grant** from the University of California Office of Academic Personnel for research on “Exploring spatial patterns of active transportation modes in Orange County”, University of California Irvine (**\$5000**) 2020

	<ul style="list-style-type: none"> • Ph.D. Dissertation Fellowship on “Developing Data-Driven Methods for Movement Pattern Analysis using a geographic context”, School of Geographical Sciences and Urban Planning, Arizona State University (\$5000) 	2017-2020
	<ul style="list-style-type: none"> • NSF Mathematical Sciences Graduate Fellowship, for research on “Human mobility pattern detection” at Oak Ridge National Laboratory. (\$12,000) 	
	<ul style="list-style-type: none"> • University Graduate Fellowship, Arizona State University for academic excellence. (\$12,000) 	2018-2019
	<ul style="list-style-type: none"> • Department of Energy Graduate Research Fellowship, for research on “Developing image segmentation techniques from LiDAR data”, at Los Alamos National Laboratory. (\$24,000) 	
HONORS & AWARDS	<ul style="list-style-type: none"> • John Randolph and Dora Haynes Foundation Faculty <i>Fellowship</i> • Social Ecology Dean’s Inclusionary Excellence Award, School of Social Ecology, University of California Irvine. • Arizona State University Hearts and Scholars <i>Fellowship</i>, School of Geographical Sciences and Urban Planning. • NSF-MSGI Research Fellowship from Oak Ridge Associated Universities through Oak Ridge Institution of Science and Education, Oak Ridge National Laboratory. (<i>Supervisor: Dr. Bandana Kar</i>) • DOE Graduate Internship for Doctoral Research, Los Alamos National Laboratory, Department of Energy. (<i>Supervisor: Emily Casleton</i>) • ASU College of Liberal Arts and Sciences <i>Graduate Professional Development Award</i>, School of Geographical Sciences and Urban Planning, Arizona State University. • Reviewer Excellence Award, Graduate Professional Student Association, Arizona State University. • International Student Representative Award, Graduate Student Committee, School of Geographical Sciences and Urban Planning, Arizona State University. • Oracle Java Certified Professional SQL and PL-SQL • ACE award for <i>innovation excellence in technology for data warehousing</i>, Accenture, Bangalore, India. • Ranjan Ray Memorial Award for being the <i>valedictorian</i> in BSc <i>Computer Science</i> department, St. Xavier’s College, Kolkata. 	2021 2022 2019 2020 Sumr 2018-2019 2019 2019 2019 2011 2014 2011
COURSES TAUGHT	<p>UPPP 100: Technology & Smart Cities (Level: Upper Division Undergraduate elective)</p> <p>UPPP 275: Advanced GIS for Planners (Level: Graduate elective)</p> <p>UPPP 214: Quantitative Analysis for Planners (Level: Graduate core course)</p> <p>SE 13: Statistical Analysis for Social Ecology (Level: Undergraduate core course)</p> <p>GIS 322: Advanced GIS Programming (Level: Graduate elective, GIS certification Course)</p> <p>GIS 222: GIS Programming for Beginners (Level: Undergraduate elective, GIS certification Course)</p>	W/2022 Sp/2022 F/2022 F/2022 Sp/2021 F/2020
STUDENT ADVISING	<p>Amin A Khammangir, PhD. In Civil and Environmental Engineering (Committee Member)</p> <p>Angela R. Kim, Ph.D. in Urban and Environmental Planning (Committee Member)</p> <p>Arash Ghaffar, Ph.D. in Transportation Engineering (Committee Member)</p> <p>Negin Shariat, Ph.D. in Transportation Engineering (External Committee Member)</p> <p>Shengxiang Jin, Ph.D. in Urban and Environmental Planning (Committee Chair)</p> <p>Huixin Zheng, Postdoctoral Fellow Urban Planning & Public Policy</p> <p>Casey Chung, Urban Studies Major (Research Supervisor)</p> <p>Mankin Law, Masters in Urban and Regional Planning (Research Supervisor)</p> <p>Krysta Christensen, Masters in Urban and Regional Planning (Research Supervisor)</p> <p>Dan Kato, Masters in Urban and Regional Planning (Practical Training Academic Advisor)</p> <p>Zian Dong, Mathematics Major (Research Supervisor)</p>	S/2023 W/2023 F/2022 F/2022 F/2022 Sp/2022 F/2021 F/2021 F/2021 W/2021 F/2021
INVITED TALKS	<ul style="list-style-type: none"> • “Spatial analytics for active transportation planning and practice”, METRANS University Transportation Consortium, University of Southern California. (<i>Invitee: Marlon Boarnet</i>) • “Spatial analytics approaches for equitable transportation planning”, ITS-Davis Seminar Series, UC Davis (<i>Invitee: Jesus M Barajas</i>) 	2024 2023 2022

- “Role of spatial analytics in electric vehicle charging infrastructure planning” , **Energy Insights**, Alfred P. Sloan Foundation & Resources for the Future (*Invitee: Evan Michelson*) 2021
- “Spatial Analytics approaches for Transportation Planning”, **Pacific Transportation Consortium (PacTrans)** Student Conference, Oregon State University. 2021
- “Crowdsourced big data and active transportation planning in North American cities”, **Bicycle and Pedestrians Subcommittee Meeting, Federal Highway Administration, USDOT** 2021
- “*Geospatial analytics for equitable transportation planning*”, **Civil and Environmental Engineering Seminar Series** (*Invitee: Jean D. Saphores*) 2021
- “*Geospatial Analytics in Urban Planning & Policy*”, **Institute for Geoinformatics**, GI-Forum, University of Muenster, Germany. (*Invitee: Christopher Kray*)
- “*Geospatial Analytics for Urban Planning and Public Policy*”, **Department of Urban Planning and Public Policy**, Colloquium, University of California, Irvine. (*Invitee: Scott A Bollens*) 2020
- *Understanding bicycle ridership using bias-corrected crowdsourced data*”, **NaTMEC** (National Travel Monitoring Exposition and Conference). (*Invitee: Rebecca L Sanders*) 2019
- “*Using Crowdsourced data from Strava to monitor bicycling ridership patterns*” Overview of Bicycle Mobility Performance Measure of the T2050 Program, **Arizona Bicycling Summit**. (*Invitee: Trisalyn A Nelson*) 2019
- Panelist on “*Identifying Research Opportunities for Geo-Computational Education*”, **1st ACM SIGSPATIAL** International Workshop on Geo-computational thinking in Education. 2019
- “*Role of crowdsourced big data in detecting mobility patterns from active transportation modes in urban areas*”, **Institute of Transportation Studies (ITS-UCI)**, Seminar Series, University of California, Irvine. (*Invitee: Michael Hyland, Jean D Saphores*) 2019
- “*Expanding coverage using crowdsourced bicycle ridership data*”, **Institute for Transportation Engineers/International Municipal Signal Association (ITE-IMSA)** Spring Conference, Phoenix. (*Invitee: Trisalyn A Nelson*) 2019

CONFERENCE PRESENTATIONS (By Paper)

- “Spatial equity of electric vehicle charging station placements in Orange County, California”
 - Transportation Research Board Annual Meeting 2023, National Academies of Sciences, Engineering, and Medicine
- “Applying machine learning to address COVID-19 risk in LA county using human mobility patterns and socio-demographic factors”
 - GEOMED 2022
- “Electric vehicle charging station accessibility issues in Orange County, California”
 - American Association of Geographers, 2022
- “Equity issues in utilization of active transportation modes in Orange County, California”
 - American Association of Geographers, 2022
- “Functional Data Analysis for Spatial-Temporal Change Detection”
 - American Association of Geographers, 2021
 - Symposium on Statistics and Data Science, American Statistical Association 2021
- “Correcting Bias in Crowdsourced Data to Map Bicycling Ridership of All Bicyclists”
 - European Geosciences Union, 2018
 - American Association of Geographers, 2020
 - National Travel Monitoring Exposition and Conference, 2021
- “A Bayesian Non-Parametric framework for image segmentation using LiDAR and Aerial Imagery captured by a UAV”
 - American Geophysical Union, 2019
- “In-Database Geospatial Analytics using Python”
 - 2nd ACM SIGSPATIAL Workshop on Advances in Resilient and Intelligent Cities, 2019
- “Characterizing the spread of COVID-19 using human mobility patterns and sociodemographic indicators”

- 3rd ACM SIGSPATIAL Workshop on Advances in Resilient and Intelligent Cities, 2020

“Understanding the Combined Effects of Geospatial Factors and Fluid Injection in Induced Earthquakes using Machine Learning”

- American Geophysical Union, 2020

Talk: “Assessing the Impact of Hurricane Sandy on Mobility Patterns in New York City across Scales”

- American Geophysical Union, 2020

ACADEMIC SERVICES

- Tenure, Merit and Promotion Ad Hoc Committee, UPPP F/'23 – F/'24
- Masters' of Public Policy (MPP) Advisory Committee, UPPP Wtr/ '24 – till date
- TRB Committees involved with services: AED40 F/'21 – till date
- TRB Annual Meeting Paper Reviewer Summer/'23
- AAG Annual Meeting Session Organizer on “Spatial Analytics Methodologies and Applications”. Spr '24
- Review Committee Member, International Transport Forum 2023 Summit, Transport Enabling Sustainable Economies, TRB, National Academies of Science Engineering and Management Wtr/'23
- Program Committee Member, ACM International conference on Computational Urban Planning and Urban Management 2023
- Organizer and session chair, “GeoAI and Deep Learning Symposium: Data-driven approaches for planning smart and resilient cities”, American Association of Geographers Annual Meeting 2023. Wtr/'23
- Organizer and session chair, “Association between the urban built environment and public health”, GEOMED 2022. Spr/'23
- Communications Director of the Geographic Information Systems and Science Specialty group at the American Association of Geographers Fall/'22
- Member of the Master of Public Policy Steering Committee, UC Irvine Fall/'22-till date
- UCI Institute of Transportation Studies, Faculty Affiliate, UC Irvine
- Program Committee member of the “Advances on Resilient and Intelligent Cities” workshop at ACM SIGSPATIAL'21. Fall/'22-till date
- Organizer and chair of a session on “Role of GIS in planning smart cities.” Association of American Geographers. AAG'22. Fall/'21-till date
- Organizer and chair of a session on “Computational approach for building smarter and healthier cities.” Association of American Geographers. AAG'20. Nov '21
- Journal Peer Reviewer – International Journal of Geographical Information Science; IEEE Transactions on Geosciences and Remote Sensing; Journal of Transport Geography; Computational Geosciences, Environment and Planning B: Urban Analytics and City Science; Computers, Environment and Urban Systems; International Journal of Health Geographics; Journal of Transport and Health; International Journal of Health Geographics; Geographical Analysis; Sustainability; International Journal of Environmental Research and Public Health; Health & Place, Transportation Research Interdisciplinary Perspectives; Transportation Research Record; Travel Behavior and Society; Sustainable Cities & Society; Transportation Research Part A:Policy and Practice. Mar '22
- Memberships - American Association of Geographers (AAG), American Planning Association (APA), American Collegiate Schools of Planning (ACSP), Association of Computing Machinery (ACM), American Geophysical Union (AGU) Mar '20
- International Student Coordinator at the Graduate Student Committee, School of Geographical Sciences and Urban Planning, Arizona State University. 2019- till date
- Student Director of the Geographic Information Systems and Science (GISS) specialty group in the Association of American Geographers. 2019-2020
- Research Grant Reviewer, Graduate and Professional Student Association, Arizona State University. 2020-2021
- Research Grant Reviewer, Graduate and Professional Student Association, Arizona State University. 2018-2019

**MEDIA &
PRESS**

1. **“Awarding diverse and inclusive research”**, UCI School of Social Ecology, University of California, Irvine 2022
2. **“Faculty awarded pandemic relief grants”**, UCI School of Social Ecology, University of California, Irvine 2022
3. **“Research develops pandemic equity analytics tool”**, UCI Social Ecology, University of California, Irvine. 2022
4. **“ASU Student creates machine learning model to identify neighborhoods most at risk for COVID-19”**, ASU Now Solutions, Arizona State University. 2020
5. **“ASU research supports using AI for building healthy, safe transportation in cities”**, ASU Now Solutions, Arizona State University. 2020
6. **“New Research corrects bias in data from fitness app”**, ASU SGSUP Newsletter, Arizona State University. 2019
7. Roy A, **“Artificial Intelligence for Healthy Transportation Planning”**. In Medium.com. 2019
8. Roy A, **“Using Python to study patterns in bicycle-related incidents from crowdsourced BikeMaps.org data”**. In BikeMaps.org . 2019

** Academic research, teaching and services remained disrupted owing to mental health reasons under the FMLA Act between January 2024 – May 2024 and personal mental well-being was at risk between March 2023 – till date for several reasons which are stated in my Self-Statement document.



February 27, 2024