

# Mehak Sachdeva, Ph.D. (*she / her*)

Postdoctoral Research Scholar

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## EDUCATION

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### Ph.D. in Geographic Information Science (2018-2022)

School of Geographical Sciences and Urban Planning, Arizona State University

**Dissertation:** Advances in Local Modeling in a Regression Framework

**Advisor:** A. Stewart Fotheringham | **Committee:** Michael Goodchild, Peter Kedron, Levi J Wolf

### M.S. Urban Planning (2014-2016)

Graduate School of Architecture, Planning and Preservation, Columbia University

**Thesis:** Urban Resilience and Urban Sustainability

### Bachelor of Architecture (2008-2013)

Department of Engineering and Technology, The Maharaja Sayajirao University of Baroda, India

**Thesis:** Reclamation Institute for Social Ecology, Rehabilitation of abandoned asbestos mines

## PUBLICATION RECORD

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**Google Scholar:** <https://scholar.google.com/citations?user=w5CaZhQAAAAJ&hl=en>

**Research Gate:** <https://www.researchgate.net/profile/Mehak-Sachdeva-2>

## MANUSCRIPTS IN PREPARATION AND UNDER REVISION

04. **Sachdeva, M.**, & Fotheringham, A.S. (*under revision*). "A Geographical Perspective on Simpson's Paradox." *Journal of Spatial Information Science*.
03. **Sachdeva, M.**, Fotheringham A.S., Li, Z., & Yu, H. "On the Local Modeling of Count Data: Multiscale Geographically Weighted Poisson Regression."
02. Mendez, C., **Sachdeva, M.**, & Miranti, R.C. "The Role of Spatial Heterogeneity in the Okun's Law: Evidence from Indonesia during COVID-19."
01. Lei, F., Ma, Y., Fotheringham, A.S., Mack, E., Li, Z., **Sachdeva, M.**, Bardin, S., & Maciejewski, R. "GeoExplainer: A visual analytics system for local spatial modeling contextualization and report generation."

## PEER-REVIEWED JOURNAL ARTICLES

09. **Sachdeva, M.**, Fotheringham, A.S., & Li, Z. (2022) "Do places have value? Quantifying the intrinsic value of housing neighborhoods using MGWR." *Journal of Housing Research*.
08. Fotheringham, A.S., & **Sachdeva, M.** (2022). "Scale and Local Modeling: New perspectives on the modifiable areal unit problem and Simpson's Paradox." *Journal of Geographical Systems*.
07. Fotheringham, A.S., & **Sachdeva, M.** (2022). "On the importance of thinking locally for statistics and society." *Spatial Statistics*.
06. Oshan, T.M., Wolf, L.J., **Sachdeva, M.**, Bardin, S., & Fotheringham, A.S. (2022). "A scoping review on the multiplicity of scale in spatial analysis." *Journal of Geographical Systems*.
05. Kedron, P., Bardin, S., Hoffman, T., **Sachdeva, M.**, Quick, M., & Holler, J. (2022). "A Replication of DiMaggio et al. (2020) in Phoenix, AZ." *Annals of Epidemiology*.

04. **Sachdeva, M.**, Fotheringham, A.S., Li, Z., & Yu, H. (2021) "Are We Measuring Spatial Nonstationarity or Nonlinearity." *Geographical Analysis*.
03. Fotheringham, A.S., & **Sachdeva, M.** (2021). "Modelling spatial processes in quantitative human geography." *Annals of GIS*.
02. Kedron, P., Quick, M., Hilgendorf, Z. & **Sachdeva, M.** (2021). "Using the specification curve to teach spatial analysis and explore geographic uncertainties" *Journal of Geography in Higher Education*.
01. Gu, H., Yu, H., **Sachdeva, M.**, & Liu, Y. (2020). "Analyzing the distribution of researchers in China: An approach using multiscale geographically weighted regression." *Growth and Change*.

#### PEER-REVIEWED BOOK CHAPTERS

03. **Sachdeva, M.**, Oshan, T., & Fotheringham, A.S. (*in print*). "Local Modeling in a Regression Framework." Chapter in the *Handbook for Spatial Analysis*, Eds. Rey, S. & Franklin, R.
02. **Sachdeva, M.**, & Fotheringham, A.S. (2020). "The Geographically Weighted Regression Framework." *The Geographic Information Science & Technology, Body of Knowledge* (4th Quarter 2020 Edition). Ed. Wilson, J.P.
01. **Sachdeva, M.** (2013). "Reclamation Institute for Social Ecology: Rehabilitation of abandoned asbestos mines in Jhadol, Rajasthan, India." Chapter in *Archiving '13 Architectural Thesis*. Council of Architecture, National Institute of Advanced Studies in Architecture.

#### AWARDS & HONORS

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- 2022 Third place in the John Odland Research Competition (\$250)**  
AAG, 2022 - Spatial Analysis and Modeling Specialty Group
- 2022 Third place in ISSR Poster Competition (\$800)**  
Institute of Social Science Research, ASU
- 2021 Graduate Service Award, Outstanding achievement in service to the school (\$1400)**  
School of Geographical Sciences and Urban Planning, ASU
- 2021 First place in Student Lighting Talks (\$250)**  
University Consortium of Geographic Information Science Symposium, 2021
- 2020 Best Research Paper, Anthony J. Brazel Research Award (\$1000)**  
School of Geographical Sciences and Urban Planning, ASU
- 2020 Graduate Professional Development Award, Outstanding achievement in teaching (\$1400)**  
School of Geographical Sciences and Urban Planning, ASU
- 2020 Graduate Development Award, Outstanding achievement in organizing technical workshops (\$1400)**  
School of Geographical Sciences and Urban Planning, ASU
- 2019 Second place in Research Poster Competition (\$100)**  
School of Geographical Sciences and Urban Planning, ASU
- 2018 University Graduate Fellowship (\$5000)**  
Arizona State University
- 2015 Studio X Research Scholarship, two-week fully funded research trip to Amman, Jordan**  
Columbia University
- 2014 K.C. Mahindra Scholarship for Post Graduate Studies Abroad (\$5000)**  
K.C. Mahindra Education Trust, India
- 2013 National Award for Excellence in Architectural Thesis (Awarded to 10 best theses across India)**  
Council of Architecture, National Institute of Advanced Studies in Architecture
- 2013 University Gold Medal for Best Design Thesis**  
The Maharaja Sayajirao University of Baroda, India

**2013 University Gold Medal for Best Overall Performance**

The Maharaja Sayajirao University of Baroda, India

**2013 University Gold Medal for Best Urban Design**

The Maharaja Sayajirao University of Baroda, India

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**INVITED WORKSHOPS & COMPETITIVE SUMMER SCHOOLS**

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**2022 Invited to host a four day technical workshop on Spatial Heterogeneity, Inference and Context**

The Graduate School of International Development, Nagoya University, Japan

**2022 Summer Institute in Computational Social Science (SICSS) at University of Pennsylvania**

Fully funded, competitive two-week summer institute

**2021 Invited to host a three day technical workshop on Spatial Heterogeneity, Inference and Visualization**

The Graduate School of International Development, Nagoya University, Japan

**2019 Google Summer of Code Fellow with Python Software Foundation (PSF)**

Funded research position to work on extending regression models within Python Spatial Analysis Library

**2019 AAG-UCGIS Summer School at the CyberGIS Center, University of Illinois Urbana-Champaign**

Fully funded (by NSF) one-week program

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**CONFERENCE PRESENTATIONS & WORKSHOPS**

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**2022** “A Geographical Perspective on Simpson’s Paradox”, Virtual oral presentation, *American Association of Geographers Annual Meeting* (**This presentation was awarded the third place in the John Odland Research Competition, SAM specialty group.**)

**2022** Session Organizer with Oshan, T.M. “On the measurement of scale in spatial processes” within the Symposium on Scale in Spatial Analytics and Modeling, *American Association of Geographers, Annual Meeting*.

**2021** “Why Scale Matters: Simpson’s Paradox, MAUP and Local Modeling” Virtual oral presentation, *University Consortium for Geographic Information Science (UCGIS) Symposium 2021* (**This presentation was awarded the 1st place in student research lightning talks.**)

**2021** “Measuring Spatial Nonstationarity vs Nonlinearity”, Virtual oral presentation, *Association of American Geographers, Annual Meeting*.

**2020** Two-hour technical virtual workshop on Multiscale Geographically Weighted Regression, *University Consortium for Geographic Information Science workshop series* (**A second instance of this workshop was subsequently invited.**)

**2020** One-hour technical virtual workshop on Multiscale Geographically Weighted Regression, *School of Geographical Sciences and Urban Planning, ASU, Virtual workshop series*.

**2020** “Multiscale Hedonic House Price Modeling: An Approach Incorporating Spatial Non-stationarity”, Virtual oral presentation, *Association of American Geographers, Annual Meeting*.

**2020** “An exploration into Simpson’s paradox using Multiscale Geographically Weighted Regression”, Virtual oral presentation, *Spatial Analysis Research Center Brownbag series*, Tempe, AZ.

**2019** “Where people prefer to live: Insights from local house price modeling”, Poster presentation, *Institute of Social Science Poster Competition, ASU*, Tempe, AZ.

**2019** “Multiscale Local House Price modeling”. Poster presentation, *School of Geographical Sciences and Urban Planning Symposium Poster Competition*, Tempe, AZ. (**This poster was awarded the second place school-wide.**)

**2019** “Local Modeling in spatial statistics”, *Oral presentation at SGSUP Symposium*, Tempe, AZ.

## RESEARCH EXPERIENCE

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- 2022-Present** **Postdoctoral Researcher** under NSF grant #2117455 - Revisiting Traditional Problems in Spatial Analysis through the Lens of Local Modeling (**PI: A. Stewart Fotheringham**)
- 2018-2021** **Graduate Student Research Associate** under NSF grant #1758786 - The Measurement of Scale and Process Heterogeneity through Local Multivariate Models (**PI: A. Stewart Fotheringham**)
- 2019** **Research assistant**, Project: Geospatial Analysis of risk factors related to preterm births across the United States, **Client: Dr. Avi Patil, Garbha Health, Phoenix**
- 2019** **Research assistant**, Project: Advances toward the “20-Minute City” vision for Tempe, **Client: City Planning Department of Tempe**
- 2015** **Research Assistant**, Resilient Island Culture Studio, Staten Island: Towards a resilient community post Sandy, **Client: Make The Road New York**

## TEACHING EXPERIENCE

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### UNIVERSITY COURSES TAUGHT

03. **Co-Instructor** - Graduate course in Local Statistical Modeling GIS-563, in-person, 8 students, offered once (Collaboratively developed and delivered course materials), Arizona State University.
02. **Instructor** - Senior undergraduate course in Programming Principles in GIS II GIS-322, online, 17 students, **offered two times** (Developed and delivered course materials, no TA support), Arizona State University.
01. **Instructor** - Undergraduate course in Geographic Information Science II (4-credits) GIS 211, in-person, 18 students, offered once (Developed and delivered all course materials), Arizona State University.

### TEACHING ASSISTANTSHIPS

03. **Graduate course assistant developer**, Spatial Statistics for Geography and Planning GIS-471, assisted with developing course materials, quizzes and final project cues, Arizona State University.
02. **Graduate teaching assistant**, Advanced Geographic Information Systems PLAN 6232 A, research oriented seminar to provide students with advanced analytical and practical skills in GIS, Columbia University.
01. **Graduate teaching assistant**, Sustainable Urban Development and International Studies PLAN 4381 A, graduate seminar on urban development practices in diverse geographies, Columbia University.

## PROFESSIONAL EXPERIENCE

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- 2016-2017** **Geospatial Data Scientist**, CARTO, Vizzuality, Inc. (Location Intelligence Platform)
- 2016** **Education and Data Intern**, CARTO, Vizzuality, Inc. (Location Intelligence Platform)
- 2016** **Urban Planner**, GWW Planning and Consultancy, New York
- 2016** **Development Intern**, New York City Economic Development Corporation
- 2015** **Data Analyst & Developer**, SHoP Architects & Center for Spatial Design, Columbia University
- 2015** **Resiliency Planning Intern**, New York City Department of City Planning, Staten Island
- 2013-2014** **Architect**, Vastu Shilpa Consultants, Sangath, India

## SERVICE

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### DISCIPLINARY SERVICE

- 2021-Present** **Student Board Member**, Spatial Analysis and Modeling Specialty, AAG.

**Review for peer-reviewed journals:** Geographical Analysis, Environment and Planning B: Urban Analytics and City Science, Socio-Economic Planning Sciences, Social Forces International, Journal of Geographic Information Science, International Regional Science Review, International Journal of Geo-Information.

## UNIVERSITY AND SCHOOL SERVICE

**2020-2022**    **Student representative,** COVID care committee, SGSUP, ASU  
**2020-2021**    **President, Graduate Student Council,** SGSUP, ASU  
**2016-2017**    **Volunteer co-organizer and speaker,** CartCamp Meetup, New York  
**2016**         **Guest Juror, GIS I Final Presentation,** M.A. First Year, Pratt University, NY.  
**2016**         **Volunteer, Community Engagement Meeting,** New York City Economic Development Corp.  
**2015-2016**   **Graphic and Content Editor,** Urban Magazine, Columbia University  
**2009**         **Volunteer for Construction Service,** Olakh-Feminist Non Governmental Organization, India

## PROFESSIONAL MEMBERSHIPS

- American Association of Geographers (AAG)
- University Consortium for Geographic Information Science

## SKILLS

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### CODING, MAPPING AND DATA ANALYSIS

Python, R, Stata, SAS, ESRI products, QGIS, Carto, PostGIS, SQL, PostgreSQL, Mapbox, JavaScript, Leaflet

### GRAPHIC DESIGN | DRAFTING & MODELING

Adobe Design Suite (Indesign, Illustrator, Photoshop), Corel Draw, MS Office, AutoCAD (2D&3D), Revit Architecture, Ecotect Analysis, ArchiCAD, Rhino, 3DS Max, Sketch-up

### INTERESTS AND HOBBIES

Running (Half-marathons: Monterey 2022, Grand Teton 2022, San Francisco 2021, Yosemite 2021, Virtual 2021, Tempe 2019; 2020), Hiking, Mentoring, Cooking, Exploring cities, Abstract painting.