

Jessica Embury

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Education

PhD Geography Expected 2027
Joint Doctoral Program at San Diego State University and University of California,
Santa Barbara
Advisors: Atsushi Nara, Somayeh Dodge

MS Geographic Information Science 2023
San Diego State University
Dissertation: *Independent Data Validation to Detect Biases in Synthetic Populations*
Committee: Atsushi Nara, Sergio Rey, Ming-Hsiang Tsou, Sahar Ghanipoor Machiani

BS Geography, with Distinction *summa cum laude* 2021
San Diego State University

Certificate of Geographic Information Science 2021
San Diego State University

Peer-Refereed Publications

Google Scholar: <https://scholar.google.com/citations?user=S9T9YvEAAAAAJ&hl=en&oi=ao>

1. **Embury, J.**, Dodge, S., Nara, A. (In preparation). Characterization of demographic and socioeconomic biases in mobile location data. [journal article]
2. **Embury, J.**, Nara, A., León, K., Herman, T., Rey, S., Solem, M. (In review). Assessing the effects of geocomputation lessons on secondary school students' perceptions of geography and computer science. [journal article]
3. **Embury, J.**, Nara, A., Rey, S., Tsou, M. H., & Ghanipoor Machiani, S. (2024). Detecting synthetic population bias using a spatially-oriented framework and independent validation data. *International Journal of Geographical Information Science*, 38(9), 1912–1938. <https://doi.org/10.1080/13658816.2024.2358399> [journal article]
4. Nara, A., **Embury, J.**, Velasco, M., Russell, R., Magdy, A., & Dony, C. C. (2024). Preparing for a Career at the Intersection of Geography and Computing: Availability and Access to Training Along Geocomputational Career Pathways. *The Professional Geographer*, 1–29. <https://doi.org/10.1080/00330124.2024.2404911> [journal article]
5. Tsou, M. H., Xu, J., Lin, C. D., Daniels, M., **Embury, J.**, Park, J., ... Gibbons, J. (2023). Analyzing Spatial-Temporal Impacts of Neighborhood Socioeconomic Status Variables on COVID-19 Outbreaks as Potential Social Determinants of Health. *Annals of the American Association of Geographers*, 113(4), 891–912. <https://doi.org/10.1080/24694452.2022.2149460> [journal article]
6. **Embury, J.**, Tsou, M.-H., Nara, A., Oren, E. (2022). A Spatio-Demographic Perspective on the Role of Social Determinants of Health and Chronic Disease in Determining a Population's Vulnerability to COVID-19. *Preventing Chronic Disease*, 19, 210414. <https://dx.doi.org/10.5888/pcd19.210414> [journal article]

7. Lowery, B. C., Swayne, M. R., Castro, I., **Embury, J.** (2022). Mapping EBT Store Closures During the COVID-19 Pandemic in a Low-Income, Food-Insecure Community in San Diego. *Preventing Chronic Disease*, 19, 210410. <http://dx.doi.org/10.5888/pcd19.210410> [journal article]
8. **Embury, J.**, Nara, A., Jin, C. (2022, November 1). Spatially weighted structural similarity index: A multiscale comparison tool for diverse sources of mobility data. In *HANIMOB'22: The 2nd ACM SIGSPATIAL International Workshop on Animal Movement Ecology and Human Mobility Proceedings*, 19-22. Seattle, WA. <https://doi.org/10.1145/3557921.3565542> [conference paper]

Non-Refereed Publications

1. **Embury, J.**, and Nara, A. (2022, November 10). Closing the Gap between Curriculum and the Professional Realities of the Geospatial Technology Industry. *American Association of Geographers*. <https://doi.org/10.14433/2017.0122> [website article]
2. **Embury, J.** (2021). Identification of High-Risk Dry Cleaning Sites in San Diego County: Spatial Analysis. *The Sage Project at San Diego State University*. Available at: <https://digitallibrary.sdsu.edu/islandora/object/sdsu%3A139137> [technical report]
3. Tsou, M.-H., Xu, J., Lin, C.-D., Daniels, M., **Embury, J.**, Ko, E., Gibbons, J. (2021). Analyzing Socioeconomic Factors and Health Disparity of COVID-19 Spatiotemporal Spread Patterns at Neighborhood Levels in San Diego County. *medRxiv*. <https://doi.org/10.1101/2021.02.22.21251757> [pre-print]

Grants and Awards

Competitive External Grants and Fellowships

2024 National Institute of Minority Health and Health Disparities (R01 in review)
Improving Health Outcomes and Advancing Health Equity in Imperial County Rural Communities through Increasing Healthy Food Access
 Total Funds Requested: \$5,072,143.00 (Role: senior personnel)

Competitive Internal Grants and Fellowships

2022-2023 College of Graduate Studies, San Diego State University
University Graduate Research Fellow
 2022-2023 College of Graduate Studies, San Diego State University
Completion of Research and Creative Activity Fellow

Awards and Recognition

2024 Thomas C. Strand Endowed Scholarship in Geography, Department of Geography, San Diego State University
 2024 Travel Grant, 86th Annual Conference of the Association of Pacific Coast Geographers
 2023 Geography Scholarship, Department of Geography, San Diego State University
 2022 George and Evelyn Parrott Memorial Endowed Scholarship in Geography, Department of Geography, San Diego State University
 2022 ACM SIGSPATIAL Travel Grant, 30th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2022)
 2021, 2022 Richard Wright Cartography Award Scholarship, Department of Geography, San Diego State University
 2021-2022 Master's Research Scholarship, College of Graduate Studies, San Diego State University
 2021 Marble-Boyle Undergraduate Achievement Award in Geographic Science, American Association of Geographers (AAG)

2021	Geosystems Applied Geography and Earth Systems Paper Award, Association of Pacific Coast Geographers Annual Conference (APCG)
2021	Esri Innovation Program Student-of-the-Year Award, Esri Innovation Program (EIP) at San Diego State University
2021	Alvena Storm Memorial Scholarship, Department of Geography, San Diego State University
2021	Undergraduate Research Excellence Award, Student Research Symposium at San Diego State University
2020-2021	Outstanding Graduating Senior, Department of Geography, San Diego State University
2019, 2020	McFarland Geography Scholarship, Department of Geography, San Diego State University

Presentations

Conference Activity

1. **Embury, J.**, Castro, I. *Improving equitable access to healthy food with spatial decision support methods*. Paper presented at the Esri User Conference, San Diego, CA, 2025. [In review]
2. **Embury, J.**, Dode, S., Nara, A. *Understanding demographic data bias in mobile location datasets*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, Detroit, MI, 2025. [In preparation]
3. **Embury, J.**, Nara, A. *Evaluating The Impact Of Geocomputation Lessons On Secondary School Students' Perceptions Of Geography And Computer Science*. Paper presented at 86th Annual Conference of the Association of Pacific Coast Geographers, Arcata, CA, 2024.
4. Dony, C., Nara, A., León, K., **Embury, J.**, Herman, T., Velasco, M. *Partnering on education research with teachers and with funding to measure aspirations of students*. Paper presented at the 109th Annual Conference of the National Council for Geographic Education, Tempe, AZ, 2024.
5. León, K., Herman, T., Nara, A., **Embury, J.**, Dony, C. *Encoding Geography: Integrating Computer Science into Geography Instruction*. Paper presented at the 109th Annual Conference of the National Council for Geographic Education, Tempe, AZ, 2024.
6. **Embury, J.** *Detecting biased mobility patterns in a synthetic population*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, Honolulu, HI, 2024.
7. **Embury, J.**, Jankowski, P., Castro, I., Nara, A. *Community Asset-Based Approach for Optimizing the Selection of Fresh Produce Access Points*. Paper presented at The 70th North American Meetings of the Regional Science Association International & the XVII Spatial Econometrics Association World Conference, San Diego, CA, 2023.
8. **Embury, J.**, Nara, A. *A Framework for the Comparative Analysis of Diverse Mobility Data*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, Denver, CO, 2023.
9. **Embury, J.**, Nara, A. *Spatially-explicit validation of an agent-based model of human activity and mobility*. Paper presented at the 30th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, Seattle, WA, 2022.
10. **Embury, J.**, Tsou, M.-H., Nara, A., Oren, E. *The dynamic roles of chronic disease, socioeconomic factors, and mobility on population vulnerability during the COVID 19 pandemic*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, 2022.
11. **Embury, J.**, Castro, I. *Tackling Food Insecurity in the San Diego Promise Zone: A Spatial Demographic Approach*. Paper presented at the 83rd Annual Conference of the Association of Pacific Coast Geographers, San Diego, CA, 2021.

12. **Embury, J.**, Tsou, M.-H. *Mapping COVID-19 in Local Communities: A San Diego Case Study*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, 2021.
13. **Embury, J.**, Tsou, M.-H. *COVID-19 and Population Vulnerability in San Diego County*. Paper presented at the 14th Annual Student Research Symposium at San Diego State University, 2021.
14. **Embury, J.**, Nara, A. *Associations between Temperature Variables and Heat-Related Deaths in the Contiguous United States*. Poster presented at the 13th Annual Student Research Symposium at San Diego State University, San Diego, CA, 2020.
15. **Embury, J.**, Tsou, M.-H. *Bars, Major Restaurants, and Food Chains in San Diego County: COVID 19 Reopening Risk*. Map presented at the 40th Annual Conference of the North American Cartographic Information Society (NACIS), 2020.
16. **Embury, J.**, Tsou, M.-H. *2017 Hospitalizations of Seniors in San Diego County*. Map presented at the Esri User Conference, 2020.

Invited Talks

1. Castro, I., **Embury, J.** *BrightSide Produce – Tackling Food and Nutrition Security*. Invited talk at the Healthy Communities Working Group, Economic Development Department, City of San Diego meeting, April 21, 2022.
2. Alo, T., Barlow, J., Graves, C., **Embury, J.**, Dykstra, C. *An SDSU-Water Board Partnership to Identify Historical Dry Cleaner Sites*. Invited talk at the San Diego Regional Water Quality Control Board, State of California quarterly meeting, June 9, 2021.

Professional Service Activities

Disciplinary

- Student representative (ad hoc) 2024-2025
Spatial Analysis and Modeling Specialty Group, American Association of Geographers
- Conference session co-organizer 2024
Exploring Geospatial Methods and Human Dynamics to Address Challenges of the Sustainable Development Goals (SDGs)
American Association of Geographers 2024 Annual Meeting
- Reviewer for Springer Nature's *Discover Social Science and Health* 2024

University and Departmental

- Website administrator and records manager 2021-2023
Geography Graduate Student Association, San Diego State University
- Student representative, Computing Committee 2022-2023
Department of Geography, San Diego State University
- Student representative, Diversity Committee 2021-2022
Department of Geography, San Diego State University

Research Experience

Research Labs

- Movement Data Science Lab, University of California, Santa Barbara 2024-present
- Center for Human Dynamics in the Mobile Age, San Diego State University 2019-present

Projects

- National Science Foundation, Award No. 2031407 2021-2024

Collaborative Research: Encoding Geography - Scaling up an RPP to achieve inclusive geocomputational education

Supervisor(s): Atshushi Nara (PI)

- National Science Foundation, Award No. 2228419 2022-2023
CIVIC-PG Track B Walk to Healthy Foods: Modeling Community-Based Assets to Increase Healthy Food Access in Underserved Communities
Supervisor(s): Iana Castro (Co-PI), Piotr Jankowski (Co-PI)
- National Science Foundation, Award No. 2348836 2021
EAGER: Innovation in Society Study Group
Supervisor(s): Ming-Hsiang Tsou (Co-PI), Atsushi Nara
- National Institutes of Health, Award No. 3U54CA132384-10S1 2020-2021
RADx-UP Initiative: Communities Fighting COVID!
Supervisor(s): Eyal Oren (Co-PI), Ming-Hsiang Tsou

Teaching Experience

- 2022-2024 **Teaching Assistant**, Department of Geography, San Diego State University
Course(s): Data Management for GIS, GIS Programming with Python, GIS Scripting Fundamentals
- 2019 **Geography Tutor**, Earth Sciences Department, Grossmont College
Course(s): Introduction to Geographic Information Science, Physical Geography, Physical Geography Lab, Human and Cultural Geography

Related Professional Experience

- 2019-2020 **GIS and Biological Monitoring Intern**, Open Space Division, Parks and Recreation, City of San Diego

Skills

Research Skills

- GIS methodologies
- Qualitative and quantitative analysis
- IRB protocol development
- Cartography
- Database management
- API data collection
- Project management
- Technical writing

Scripting Languages

- Python
- SQL
- HTML and CSS
- Familiarity with JavaScript, R, Java

Computer Software

- ArcGIS Pro, ArcGIS Online
- Esri Apps, Dashboards, StoryMaps
- PostgreSQL, PostGIS
- Git, GitHub
- LINGO
- Microsoft Office Suite