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James D. Gaboardi

Education

2014–2019 **PhD Geography**, *Florida State University*, Tallahassee, Florida
Advisor: David C. Folch
Committee: Mark W. Horner, Chris K. Uejio, Michael J. Brusco

2013–2014 **MS GISci**, *Florida State University*, Tallahassee, Florida

2000–2005 **BA Liberal Studies**, *University of Central Florida*, Orlando, Florida

Appointments

2021 ~ (remote) **Assoc. R&D Scientist**, *Oak Ridge National Laboratory*
Geospatial Science and Human Security – Human Geography
- Research Software Development & Engineering
- Synthetic Population Generation & Digital Twin Modeling
- Spatial Network-centric Human Mobility Analysis

2019–2021 (remote) **Post Doctoral Scholar**, *Pennsylvania State University*
"Fixing" 1990-2010 Census Geography (NHGIS) – NSF Award #1825768
- Analyzing and standardizing census geographies in Python (2.x & 3.x) and SAS
- Building data workflows on Red Hat Enterprise Linux Server (6)/PBS cluster
- Geocoding restricted census microdata in SAS 9.4

2016–2019 (hybrid) **Graduate Research Assistant**, *Florida State University*
Spatial Sciences Census Research Node (SSCRN) – NSF Award #1132008
- Development of GIS algorithms in Python, R, & Bash
- Building & testing of virtual Python environments on RHEL Server 5 & 6
- Special Sworn Status at the US Census Bureau to work with restricted data
- Implemented a customized optimization routine for cluster job scheduling
  - modified minimax problem – efficient jobs processing running 100s of hours

2014–2019 **Instructor of Record**, *Florida State University*
Spatial Data Analysis, Introduction to GIS, World Regional Geography

2014–2019 **Graduate Teaching Assistant**, *Florida State University*
Map Analysis, Florida GIS Applications, Physical Geography

2014–2019 **Lab Instructor**, *Florida State University*
Introduction to GIS

Affiliations (past & present)

Python Spatial Analysis Library (PySAL)
Research Team on Urban Structure at Charles University (RToUS@USCUNI)
The Peter R. Gould Center
IPUMS – The National Historical Geographic Information System
Spatial Sciences Census Research Node

Core Software Competencies

VCS	Python RSE	Spatial Python	Other
· git	· infrastructure	· PySAL	· LaTeX
· GitHub	· testing	· GeoPandas	· QGIS
· GitLab	· packaging	· Shapely	· Bash

Other Professional Experience

2015 **GIS Consultant**, *Marquis Software*, Tallahassee, Florida, USA
2014 **Technical Rover**, *Leon Cty. Supv. of Elec.*, Tallahassee, Florida, USA
2014 **GIS Technician**, *Citizens Property Insurance*, Tallahassee, Florida, USA
2014 **Graduate Intern**, *FREAC*, Tallahassee, Florida, USA
2009–2012 **Eiken Specialist**, *STEP*, Tokyo, Japan
2008 **Marketing Communications Specialist**, *Oracle*, Tokyo, Japan

Major Open Source Contributions

Lead Dev. pysal/spaghetti. Gaboardi, J.D., Laura, J., Rey, S., Wolf, L.J., Folch, D.C., Kang, W., Stephens, P., and Schmidt, C. (2018) DOI: 10.5281/zenodo.1343650

Lead Dev. pysal/spopt. Feng, X., Gaboardi, J.D., Knaap, E., Rey, S.J., and Wei, R. (2021) DOI: 10.5281/zenodo.4444155

Co Maint. pysal/momepy. Fleischmann, (2019). momepy: Urban Morphology Measuring Toolkit. Journal of Open Source Software. 4(43), 1807. DOI: 10.21105/joss.01807

Open Reviews

2024 **Gaboardi, J.D.**, *Peer Review Report For: Simulated data for census-scale entity resolution research without privacy restrictions: a large-scale dataset generated by individual-based modeling [version 1; peer review: 1 approved, 1 approved with reservations, 1 not approved]*, Gates Open Research, 8:36. DOI: 10.21956/gatesopenres.16769.r37051

2022 **Kucharski, R., Fleischmann, M., and Gaboardi, J.D.**, *Peer Review Report For: DRSP-Sim: A Simulator for Ride-Sharing with Pooling: Joint Matching, Pricing, Route Planning, and Dispatching*, Journal of Open Source Software, Rejected. Review: openjournals/joss-reviews#3761

2022 **Gaboardi, J.D., Mary, B., and Fleischmann, M.**, *Peer Review Report For: TessPy: a python package for geographical tessellation*, Journal of Open Source Software, 7(76) 4620. DOI: doi.org/10.21105/joss.04620 Review: openjournals/joss-reviews#4620

2021 **Gaboardi, J.D., Graser, A., and Fleischmann, M.**, *Peer Review Report For: TransBigData: A Python package for transportation spatio-temporal big data processing, analysis and visualization*, Journal of Open Source Software, 7(71) 4021. DOI: doi.org/10.21105/joss.04021 Review: openjournals/joss-reviews#4021

Peer-Reviewed Publications

2024 **De, D., Thakur, G.M., McGaha, J., Brown, C., Nie, X., Thomas, T., Gaboardi, J.D., Sparks, K., Burger, A., McBride, E.C., Kim, J.-S., Amichi, L., Gunaratne, C., Christopher, S.C., and Zubko, D.**, *DICER: Data Intensive Computing Environment and Runtime for Evaluating Unprecedented Scale of Geospatial-Temporal Human Mobility Data*, 25th IEEE International Conference on Mobile Data Management (MDM), Brussels, Belgium, 139-148. DOI: 10.1109/MDM61037.2024.00037

2024 **Kim, J.-S., Thakur, G.M., Amichi, L., Burger, A., Gunaratne, C., Tuccillo, J.V., Hauser, T., Bentley, J., Sparks, K., De, D., Brown, C., McBride, E.C., McGaha, J., Gaboardi, J.D., Nie, X., and Christopher, S.C.**, *HumoNet: A Framework for Realistic Modeling and Simulation of Human Mobility Network*, 25th IEEE International Conference on Mobile Data Management (MDM), Brussels, Belgium, 185-194. DOI: 10.1109/MDM61037.2024.00042

2024 **Fowler, C.S., Gaboardi, J.D., Schroeder, J.P., and Van Riper, D.C.**, *Optimized spatial information for 1990, 2000, and 2010 U.S. census microdata*, Scientific Data, 11 (37) DOI: 10.1038/s41597-023-02859-9

2023 **Tuccillo, J.V., Gaboardi, J.D.**, *Spatial Microsimulation and Activity Allocation in Python: An Update on the Likeness Toolkit*, Proceedings of the 22nd Python in Science Conference, 93–100 DOI: 10.25080/gerudo-f2bc6f59-00c

2023 **Bearman, N., Xu, R., Roddy, P.J., Gaboardi, J.D., Zhao, Q., Chen, H., and Wolf, L.J.**, *Developing capacitated p-median location-allocation in the `spopt` library to allow UCL student teacher placements using public transport*, AGILE: GIScience Series, Volume 4, 1–7 DOI: 10.5194/agile-giss-4-20-2023

2022 **Tuccillo, J.V., Gaboardi, J.D.**, *Likeness: a toolkit for connecting the social fabric of place to human dynamics*, Proceedings of the 21st Python in Science Conference, 125–135 DOI: 10.25080/majora-212e5952-014

2022 **Feng, X., Barcelos, G., Gaboardi, J.D., Knaap, E., Rey, S.J., and Wei, R.**, *spopt: a python package for solving spatial optimization problems in PySAL*, Journal of Open Source Software, 7(74) 3330. DOI: 10.21105/joss.03330

2021 **Rey, S.J., Anselin, L., Amaral, P., Arribas-Bel, D., Cortes, R.X., Gaboardi, J.D., Knaap, E., Kang, W., Li, Z., Lumnitz, S., Oshan, T.M., Shao, H., and Wolf, L.J.**, *The PySAL Ecosystem: Philosophy and Implementation*, Geographical Analysis, (54) 467-487. DOI: 10.1111/gean.12276

2021 **Gaboardi, J.D., Rey, S.J., and Lumnitz, S.**, *spaghetti: spatial network analysis in PySAL*, Journal of Open Source Software, 6(62) 2826. DOI: 10.21105/joss.02826

2020 **Gaboardi, J.D., Folch, D.C., and Horner, M.W.**, *Connecting Points to Spatial Networks: Effects on Discrete Optimization Models*, Geographical Analysis, (52) 299–322. DOI: 10.1111/gean.12211

Working Papers

2020 **Gaboardi, J.D.**, *Validating Abstract Representations of Spatial Population Data while considering Disclosure Avoidance*, Center for Economic Studies, U.S. Census Bureau, DOI: 10.5281/zenodo.3677162

Dissertation

2019 **Gaboardi, J.D.**, *Populated Polygons to Networks: A Population-Centric Approach to Spatial Network Allocation*, FSU DigiNole

Awards & Grants

2022 Optimisation of teacher training placement allocations using `spopt`. *AGILE 2023*. GitHub Repo.

2019 Student Paper Competition (2nd Place). *American Association of Geographers Spatial Analysis & Modeling Specialty Group*. $300.

2019 Travel Award. *American Association of Geographers Spatial Analysis & Modeling Specialty Group*. $250.

2018, 2019 Research Travel Grants. *Atlanta Research Data Center*. $1,966.

2017 Dissertation Mentorship Program. *Center for Economic Studies*. United States Census Bureau.

2017 Sponsored Travel. *NSF Census Research Network Meeting*. Washington, DC.

2015–2019 Conference Presentation Grants. *Florida State University*. $4,350.

2015 Outstanding PhD Student. *Florida State University*. Dept. of Geography.

Invited Talks & Seminars

2024 **Capabilities and Applications of the UrbanPop Spatial Microsimulation Framework**, *United States Census Bureau's GEO Seminar Series*, Webinar

2023 **Open-Source Software for Population Modeling and Spatial Optimization: Making Decision Support More Accessible**, *Inha University Graduate School of Logistics: BK21 Spring 2023 Lecture Series*

Workshops & Tutorials

2022 Understanding the Structure of Cities through the Lens of Data. *Spatial Data Science Symposium*. (Virtual). GitHub Repo

Conference Presentations & Posters

2024 DICER: Data Intensive Computing Environment and Runtime for Evaluating Unprecedented Scale of Geospatial-Temporal Human Mobility Data. *25th IEEE International Conference on Mobile Data Management (MDM)*. Brussels, Belgium. 10.1109/MDM61037.2024.00037

HumoNet: A Framework for Realistic Modeling and Simulation of Human Mobility Network *25th IEEE International Conference on Mobile Data Management (MDM)*. Brussels, Belgium. 10.1109/MDM61037.2024.00042

Examining Food Access Disparities using Spatial Microsimulation. *Population Association of America 2024 Annual Meeting*. Columbus, Ohio.10.5281/zenodo.11060894

2023 Spatial Microsimulation & Activity Allocation in Python: An Update to the Likeness Toolkit. *Scientific Computing with Python*. Austin, Texas.10.25080/gerudo-f2bc6f59-01a

Developing capacitated p-median location-allocation in the `spopt` library to allow UCL student teacher placements using public transport. *26th AGILE Conference on Geographic Information Science "Spatial Data for Design"*. Delft, the Netherlands (Virtual).

Bridging population, activity space, and social interactivity with the Likeness software stack. *ACS Data Users Conference*. Washington, D.C. (Virtual). 10.5281/zenodo.10011877

Spatial Microsimulation and Activity Allocation for Examining COVID-19 Vaccine Access Profiles. *American Association of Geographers*. Denver, Colorado (Virtual). 10.5281/zenodo.7768809

2022 New Insights into the Tightly Coupled Social Fabric of the Built Environment. *American Geophysical Union*. Chicago, IL.

Examining COVID-19 Vaccine Access Profiles through Spatial Microsimulation and Activity Allocation. *North American Regional Science Council*. Montreal, Canada. 10.5281/zenodo.7335794

Likeness: a toolkit for connecting the social fabric of place to human dynamics. *Scientific Computing with Python*. Austin, Texas. 10.25080/majora-212e5952-02d

Likeness: a Python toolkit for connecting the social fabric of place to human dynamics. *GeoPython*. Basel, Switzerland (Virtual). 10.5281/zenodo.6685086

Optimized Spatial Census Information Linked Across Time (OSCILAT): Improving the spatial accuracy of 1990, 2000, and 2010 census microdata. *Population Association of America 2022 Annual Meeting*. Atlanta, Georgia (Virtual). 10.5281/zenodo.6596527

Simulating Travel to Points of Interest for Demographically-rich Synthetic Populations. *American Association of Geographers*. (Virtual). 10.5281/zenodo.6335783

2019 Validation of Abstract Population Representations. *Atlanta Research Data Center Annual Research Conference at Vanderbilt University (ARDC)*. Nashville, Tennessee. 10.5281/zenodo.4287456

A Polygon-Based Approach to Spatial Network Allocation. *American Association of Geographers*. Washington, D.C.

2018 A Polygon-Based Approach to Spatial Network Allocation. *North American Regional Science Council*. San Antonio, Texas.

A Polygon-Based Approach to Spatial Network Allocation. *American Association of Geographers*. New Orleans, Louisiana.

2017 Connecting Points to Spatial Networks: Effects on Discrete Spatial Network Optimization Models. *North American Regional Science Council*. Vancouver, BC, Canada.

An Out-of-Core Computational Approach to the Transportation Problem. *American Association of Geographers*. Boston, Massachusetts.

2016 The Effects of Centroid Connector Density on the p-median and p-center Discrete Spatial Network Optimization Models. *North American Regional Science Council*. Minneapolis, Minnesota.

Automating Multiple Single-Objective Spatial Optimization Models for Efficiency and Reproducibility. *American Association of Geographers*. San Francisco, California.

2015 Network-Based Model Building for Discrete Location Allocation in Python: Integrating PySAL and Gurobi. *Seven Hills User Group Annual Conference*. Tallahassee, Florida.

Network-Based Model Building for Discrete Location Allocation in Python: Integrating PySAL and Gurobi. *North American Regional Science Council*. Portland, Oregon.

The Effects of Centroid Connector Density on Spatial Network Optimization Models. *American Association of Geographers*. Chicago, Illinois.

2014 The Effects of Centroid Connector Density on Spatial Network Optimization Models. *Seven Hills User Group Annual Conference*. Tallahassee, Florida.

Service & Diversity

Grad. Rep. *22nd Congress of Graduate Students*. Florida State University.

Grad. Rep. *Faculty Senate Library Committee*. Florida State University.

Liaison *Geography & Environmental Studies Student Assoc*. Florida State University.

Member *Code of Conduct Committee*. PySAL.

Member *Steering Committee*. PySAL.

Member *University Libraries Grad. Advisory Board*. Florida State University.

Member *University Libraries Grad. Advisory Council*. Florida State University.

Mentor *Google Summer of Code 2021, 2022a, 2022b, 2022c, 2023* – PySAL.

Organizer *Automated GISci for Network-based Decisions*. AAG Meeting 2017–2019.

Organizer *Room to Read/Beers for Books*. Tokyo, Japan.

Panelist *Careers in Public Policy*. 2015. Florida State University.

Panelist *Future of open source package of spatial analysis – PySAL*. American Association of Geographers, New Orleans, Louisiana.

Program Committee *Proceedings of the 22nd Python in Science Conference*. Austin, Texas.

Referee	*Environment and Planning B: Urban Analytics and City Science, Gates Open Research Foundation, Geographical Analysis, Journal of Geographical Systems, Journal of Open Source Software, International Journal of Applied Earth Observation and Geoinformation, International Journal of Geographical Information Science, Networks and Spatial Economics, Social Science Japan Journal, Spatial Economic Analysis, Sustainability, Transportation Research Record.*
Secretary	*Florida Surveying & Mapping Society.* Northwest Florida Chapter.
Session Chair	*Location and Spatial Analysis III.* North American Regional Science Council. Minneapolis, Minnesota.
Session Chair	*Special Session: GeoComputation 2: Networks.* North American Regional Science Council. Vancouver, BC, Canada.
Volunteer	*Imbodehuus St. Gallen.* St. Gallen, Switzerland.
Volunteer	*Hillcrest School for Exceptional Children.* Ocala, FL.

Academic & Professional Associations - (current & past)

American Association of Geographers
Florida Surveying & Mapping Society
Population Association of America
Mathematical Optimization Society
Regional Science Association International
Seven Hills Regional User Group
United States Research Software Engineer Association

Relevant Coursework

Fac. Loc. & Spat. Optimization	Fac. Loc. in Operations Research
High Perf. Spatial Computing	Spat. Algo. on Restricted-use Data
Network Analysis in Python	GIS Programming with Python
Adv. Network Analysis in Python	Spatial Optimization & Racial Seg.
Spatial Modeling in GIS	Transport Geography
Network Allocation	Spatial Databases
Smart Cities	GIS in Social Science
Social Vuln. to Nat. Hazards	Resp. Research & Ethical Conduct
Land Surveying Methods	Remote Sensing
Geographic Research Methods	Geographic Thought
Professional Dev. in Geography	Land Surveying Methods
Urban & Regional Info. Sys. Prac.	Advanced GIS
Urban & Regional Info. Sys	Intro GIS
Quantitative Geography	Writing in the Sciences

Languages

Native: English
JLPT N3: Japanese
Elementary: German, Italian, Spanish

Personal Information

Born: Ocala, Florida, USA
Citizenship: USA
Resided: USA (Florida, Georgia), Italy, Switzerland, Japan

September, 2024