

Catalina Medina

Email: catalmm1@uci.edu
GitHub: <https://catalinamedina.github.io/>

Research Interests

- Bayesian statistics and epidemiological applications of statistics to better understand disease and infection, especially through collaborations with public health researchers.
 - Statistics and data science education research promoting student engagement with open access materials.
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Education

PhD, Statistics

June 2025 (Expected)

Co-advised by: Volodymyr Minin and Mine Dogucu
University of California, Irvine

MS, Statistics

June 2021

University of California, Irvine

BS, Mathematics with specialization in Statistics and Minor in Biology

May 2019

University of Nevada, Reno

Manuscripts

Peer-Reviewed Publications

- **Medina, C. M.**, Palacios J. A., Minin, V. M. (2025). Accounting for reporting delays in real-time phylodynamic analyses with preferential sampling. *PLoS Computational Biology* 20(5): e1012970.
- Dogucu, M., Demirci, S., Bendekgey, H., Ricci, F. Z., & **Medina, C. M.** (2025). A Systematic Literature Review of Undergraduate Data Science Education Research. *Journal of Statistics and Data Science Education*, 1–20.
- Ricci, F., **Medina, C. M.**, & Dogucu, M. (2024). Designing and implementing an automated grading workflow for providing personalized feedback to open-ended data science assignments. *Technology Innovations in Statistics Education*, 15(1).
- Parker, D.M., **Medina, C.**, Bohl, J., Lon, C., Chea, S., Lay, S., Kong, D., Nhek, S., Man, S., Doehl, J.S.P., Leang, R., Kry, H., Rekol, H., Oliveira, F., Minin, V.M., & Manning, J.E. (2023). Determinants of exposure to Aedes mosquitoes: a comprehensive geospatial analysis in peri-urban Cambodia. *Acta Tropica*, 239, 106829.
- Parker, D.M., Bruckner, T., Vieira, V.M., **Medina, C.**, Minin, V.N., Felgner, P.L., Dratch, A., Zahn, M., Bartell, S.M., & Boden-Albala, B. (2021). Predictors of test positivity, mortality, and seropositivity during the early coronavirus disease epidemic, Orange County, California, USA. *Emerging Infectious Diseases*, 27(10), 2604.

Pre-Prints / Under Review

- **Medina, C. M.**, Palacios, J. A., & Minin, V. M. (2024+). Accounting for reporting delays in real-time phylodynamic analyses with preferential sampling. arXiv.2407.18432
(Accepted to be published in *PLOS Computational Biology*)
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Teaching Experience

Instructor of Record

UC Irvine - Designed and taught an introductory five-week course with a teaching assistant.

- Basic Statistics (Stats 7) Summer 2022
40 undergraduate students

University of Nevada, Reno - *Taught two remedial five-week courses without a teaching assistant.*

- Elementary Algebra (Math 95) Summer 2019
25 undergraduate students
- Intermediate Algebra (Math 96) Summer 2019
25 undergraduate students

Teaching Assistant

UC Irvine - *Responsibilities included preparing and running weekly hour-long discussion/lab sessions and holding office hours, for two sections per class.*

- Introduction to Probability and Statistics I (Stats 120A) Fall 2022
43 undergraduate students
- Statistical Methods for Data Analysis I (Stats 110) Summer 2021
77 undergraduate and graduate students
- Introduction to Probability and Statistics (Stats 120A) Summer 2020
77 undergraduate students
- Introduction to Probability and Statistics for Computer Science (Stats 67) Spring 2020
119 undergraduate students
- Statistical Methods for Data Analysis II (Stats 111) Winter 2020
99 undergraduate and graduate students
- Introduction to Biological Statistics (Stats 8) Fall 2019
88 undergraduate students

Teaching Preparation

- ★ California State University Pre-Professor Program Fellow Fall 2024
Graduate Division, UC Irvine and California State University, Long Beach
 - Guest lectured undergraduate-level Biostatistics (HSC 403) Nov. 19, 2024
 - Guest lectured graduate-level Regression Analysis (Stats 510) Nov. 12 & 14, 2024
- Preparing for Careers in Teaching Statistics and Data Science Workshop Summer 2024
Section on Statistics and Data Science Education, American Statistical Association
- Summer Teaching Apprenticeship Program Fellow Summer 2022
Division of Teaching Excellence and Innovation, UC Irvine

Awards

- Excellence in Research Award 2023
Latino Excellence and Achievement, Donald Bren School of ICS, UC Irvine
- Conference Travel Award 2022 & 2018
National Diversity in STEM Conference, Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)
- Outstanding Graduate Teaching Assistant Award 2020
Department of Statistics, UC Irvine
- Undergraduate Research Award 2019
University of Nevada, Reno

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- Prize for Undergraduate Research in Quantitative Biology (Runner-up)
NSF-Simons Center for Quantitative Biology, Northwestern University 2018
 - Capstone Conference Travel Award
Mathematical Biosciences Institute, Ohio State University 2018
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Conference Presentations

Accounting for Reporting Delays in Real-Time Inference of Infectious Diseases Dynamics Using Pathogen Genetic Sequences

- ★ *SACNAS National Diversity in STEM (NDiSTEM) Conference* Oct. 2024
Talk, Phoenix, AZ
- *Joint Statistical Meeting (JSM)* Aug. 2024
Speed talk & poster presentation, Portland, OR
- *Statistical and Machine Learning Applications in Biomedical Sciences Workshop* Feb. 2024
Poster, UC Irvine
- *SACNAS NDiSTEM Conference* Oct. 2022
Poster, San Juan, Puerto Rico

Automate Your Grading Workflow With gradetools: A Grading Assistant in RStudio

- *Electronic Conference on Teaching Statistics (eCOTS) Regional* Jun. 2024
Flash talk, UC Irvine
- *United States Conference on Teaching Statistics (USCOTS)* Jun. 2023
Workshop, State College, PA
- ★ *Researchers of Statistics Education (ROSE) Conference* May 2023
Invited presentation, online

Building Data Science Education Research Plan for Teacher-Scholars

- ★ *Electronic Conference On Teaching Statistics (eCOTS)* Jun. 2023
Breakout session, selected as "hot topic of the day", online

Determinants of Exposure to Aedes Mosquitoes: A Comprehensive Geospatial Analysis in Peri-Urban Cambodia

- *GEOMED: Interdisciplinary Conference on Spatial Statistics, Spatial Epidemiology, and Geographical Aspects of Public Health* Oct. 2022
Poster, UC Irvine

Host-Pathogen Dynamics: Quantifying Process-Level Variation Using a System-Specific Dynamical Model in a Non-Linear Mixed Effects Modeling Framework

- *College of Science Poster Session* Nov. 2018
Poster, University of Nevada, Reno
- *Conference on Quantitative Approaches in Biology* Nov. 2018
Poster, Northwestern University
- *SACNAS NDiSTEM Conference* Oct. 2018
Poster, San Antonio, TX
- *McNair Symposium* Aug. 2018
Talk, University of Nevada, Reno
- *Mathematical Biosciences Institute Capstone Conference* Aug. 2018
Poster, Ohio State University
- *National McNair Conference* Jul. 2018
Talk, University of California, Los Angeles

Service and Outreach

Departmental Service

- ★ Graduate student representative, UC Irvine Statistics Department Fall 2021 - Spring 2024
 - Managed graduate student involvement in faculty hiring process
 - Organized and led visitation day for admitted PhD students
 - Founded, organized, and led orientation for first-year graduate students
 - Reported on graduate student matters at weekly faculty meetings

Professional Service

- Session organizer: Facilitating Biomedical Discoveries and Public Health Decision Making Oct. 2024
SACNAS NDiSTEM Conference, Phoenix, AZ
- Panel moderator: What's Next in Four-Year Institutions? Jun. 2024
eCOTS, UC Irvine
- Panelist: Graduate School Nov. 2020
Association for Women in Mathematics, University of Nevada, Reno

Outreach

- Panel moderator: Biostatistics Career Panel Aug. 2022 & 2023
ISI-BUDS, UC Irvine
- Panel moderator: Diversity Equity and Inclusion in Biostatistics Jul. 2023
ISI-BUDS, UC Irvine
- Panelist: Societal and Ethical Issues in Computational and Informational Sciences Apr. 2023
Diverse Educational Community and Doctoral Experience, UC Irvine
- Panelist: Graduate School Jul. 2020
ISI-BUDS, UC Irvine
- Creator of animated maps to visualize Orange County COVID-19 cases, tests, and percent positivity by zip code for the public 2021
COVID-19 Trends by UC Irvine
- Panelist: Careers for Mathematics, Physics, and Atmospheric Science Majors Nov. 2020
First-year seminar, University of Nevada, Reno
- Invited presentation: My Early Graduate School Experience and Life at UC Irvine Dec. 2020
McNair Scholars University of Nevada, Reno

Mentoring

- Competitive Edge Summer Research Program mentor Summer 2023
Graduate Division, UC Irvine
- Mentoring Excellence Certificate Summer 2023
Graduate Division, UC Irvine
- First year statistics graduate student mentor 2021 - 2023
Diverse Educational Community and Doctoral Experience, UC Irvine

Programs and Professional Membership

- American Statistical Association
 - Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)
 - 2018-2019 McNair Scholar at University of Nevada, Reno
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Software Developed

- **phylodyn2** R package for viral phylodynamic inference with ability to account for reporting delays in real-time analyses with preferential sampling.
- **gradetools** R package to help automate grading workflows and facilitate in creating individualized assignment feedback for students.

Certifications

Summer Institute in Statistics and Modeling in Infectious Diseases, University of Washington

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| • Certification in Stochastic Epidemic Models with Inference | 2021 |
| • Certification in MCMC II for Infectious Diseases | 2021 |
| • Certification in Evolutionary Dynamics and Molecular Epidemiology of Viruses | 2021 |
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