

Catalina Medina

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Research Interests

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

Education

PhD, Statistics Co-advised by: Volodymyr Minin and Mine Dogucu University of California, Irvine	Jun. 2025 (Expected)
MS, Statistics University of California, Irvine	Jun. 2021
BS, Mathematics with specialization in Statistics and Minor in Biology University of Nevada, Reno	May 2019

Teaching Experience

Instructor of Record - UC Irvine

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

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| • Basic Statistics (Stats 7)
40 undergraduate students | Summer 2022 |
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Instructor of Record - University of Nevada, Reno

Taught two remedial five-week courses without a teaching assistant.

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

Teaching Assistant - UC Irvine

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

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

California State University Pre-Professor Program Fellow Graduate Division, UC Irvine	Fall 2024
Preparing for Careers in Teaching Statistics and Data Science Workshop Section on Statistics and Data Science Education, American Statistical Association	Fall 2024
Summer Teaching Apprenticeship Program Fellow Division of Teaching Excellence and Innovation, UC Irvine	Summer 2022

Manuscripts

Peer-Reviewed Publications

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. and 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.

Under preparation / Pre-prints

[Submitted] **Medina, C. M.**, Palacios, J. A., Minin, V. M. (2024+). Accounting for reporting delays in real-time phylodynamic analyses with preferential sampling.
<https://arxiv.org/abs/2407.18432>

[In revisions] Dogucu, M., Demirci, S., Bendekgey, H., Ricci F. Z., & **Medina, C. M.** (2024+). Undergraduate data science education: Who has the microphone and what are they saying?
<https://doi.org/10.48550/arXiv.2403.03387>

Awards

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

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
Session: (Bio)statistics: Facilitating biomedical discoveries and public health decision making
Talk & session organizer, 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 National Diversity in STEM (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 National Diversity in STEM (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
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Professional Service and Outreach

Graduate student representative, UC Irvine Statistics Department	Fall 2021 - Spring 2024
<ul style="list-style-type: none"> 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 	
Panel moderator: What's Next in Four-Year Institutions?	Jun. 2024
<i>Electronic Conference on Teaching Statistics Regional</i> , UC Irvine	
Panelist: Societal and Ethical Issues in Computational and Informational Sciences	Apr. 2023
Diverse Educational Community and Doctoral Experience, 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 https://www.stat.uci.edu/covid19/index.html	
Panelist: Careers for mathematics, physics, and atmospheric science majors	Nov. 2020
First-year seminar, University of Nevada, Reno	
Panelist: Graduate school	Nov. 2020
Association for Women in Mathematics, 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

Software Developed

<p>phylodyn2 R package for viral phylodynamic inference with ability to account for reporting delays in real-time analyses with preferential sampling. https://github.com/CatalinaMedina/phylodyn2</p> <p>gradetools R package to help automate grading workflows and facilitate in creating individualized assignment feedback for students. (<i>co-developer</i>) https://federicazoe.github.io/gradetools/</p>

Certifications

Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID), University of Washington	
<ul style="list-style-type: none"> Certification in Stochastic Epidemic Models with Inference Certification in MCMC II for Infectious Diseases Certification in Evolutionary Dynamics and Molecular Epidemiology of Viruses 	2021 2021 2021
