

Emi Cervantes

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SUMMARY

Student at the University of California, Irvine pursuing a Bachelor of Science in Mathematics, Data Science concentration; expected to graduate in Fall 2024 with Statistics minor and department honors. Highly motivated student with over two years of experience in conducting both Statistics and Applied Mathematics research, capable of collaborating effectively and closely with a group of diverse researchers. Passionate about applying skills in both Applied Mathematics and Statistics to create efficient and accessible tools for analyzing data to solve problems that arise in the real world.

EDUCATION

University of California, Irvine

Sep 2020 - Jun 2024

B.S. Mathematics - Data Science Concentration (Department Honors)

Minor in Statistics

Relevant Coursework: Multivariable Calculus I/II, Real/Complex Analysis, Linear Algebra, Numerical Analysis, Optimization, Statistics and Probability, Statistical Computing, Artificial Intelligence

RESEARCH INTERESTS

Mathematical data science, optimization and numerical analysis, multivariate models, high-dimensional data analysis, computational modeling for psychology and health sciences.

AWARDS AND FELLOWSHIPS

Dec 2023	Undergraduate Research Opportunities Program (UROP) Research Experience Fellowship (\$444) UC Irvine's undergraduate research fellowship. Awarded for research project titled, "Uncovering the Relationship between Math Anxiety and Mind Wandering with Machine Learning".
Jan 2023 - Dec 2023	Career Pathways for Research in Learning, Education, Analytics, and Data Science (CP-LEADS) Fellowship (IES funded \$6000) A year-long research fellowship program for using Data Science tools to conduct independent research in Education Sciences and prepping for doctoral study.
Jan 2022 - Aug 2022	SoCal Data Science Fellowship (REU) (NSF funded \$5000) A summer REU program for training underrepresented students in STEM to conduct Data Science research with real-world data.
Dec 2022 - Present	Department of Mathematics Honors Program Honors program for undergraduate students in Department of Mathematics who maintain upper-division math GPA of 3.5 or above and complete honor courses.
Dec 2020 - Present	Dean's Honor List (8 quarters) Given to undergraduate students who earn a GPA of 3.5 or above in a quarter.
Dec 2020 - Present	Hispanic Scholarship Fund (HSF) Scholar Scholar support service for undergraduate students who are of Hispanic heritage and meet academic criteria.
Jun 2023	Working Memory and Plasticity Symposium Best Presentation Best poster presentation.

RESEARCH EXPERIENCE

Greedy Approach to Kaczmarz Method with Oblique Projections

Sep 2022 - Present

Student Researcher - UCI Department of Mathematics

PI: Anna Ma, Ph.D.

- Develop and prove theorems for new iterative algorithm, *greedy Kaczmarz method with oblique projections* to solve a large-scale linear system.
- Utilize *Python* to run extensive numerical experiments of algorithm to ensure its functionality and write manuscript for publication.

Gender Difference in the Impact of Worked Examples on Math Anxiety

Jan 2023 - Dec 2023

Research Fellow - UCI School of Education

PI: Lindsey Richland Ph.D., June Ahn Ph.D., Fernando Rodriguez Ph.D.

- Implemented *structural equation models (path analysis)* to large data from per-post design experiment, to evaluate the gender-specific effects of worked examples on math anxiety using *R* packages.
- Built the models based on the theoretical frameworks on the relationship between mind wandering and math anxiety, and their effect on the learning achievements of students through collaboration with PI and lab members.

Impact of Mediterranean and DASH Diets on MPN Symptoms

Jan 2022 - Aug 2022

Student Researcher - UCI School of Medicine

PI: Angela Fleischman Ph.D., M.D.

- Employed *linear mixed effect model* to clinical trial data with *R* software to determine the effectiveness of Mediterranean diets in improving symptoms of patients with myeloproliferative neoplasms (MPN).
- Collaborated with a diverse group of researchers including biologists and computer scientists to find a solution to our research question, and presented findings at conferences.

Cancer Treatment and Development of Resistance

Mar 2022 - Jun 2022

Student Researcher - UCI Department of Mathematics

PI: Anthony Zamora, Natalia Komarova Ph.D.

- Developed *population growth ODE models* to predict the population growth of both susceptible and resistant tumor cells, under different therapy conditions.
- Created simulation software using *Python* packages to test and optimize the model while adjusting the conditions of cancer therapy.

Upcoming Research

Math Anxiety and Mind Wandering: Machine Learning Insight

Nov 2023 - Present

Research Fellow - UCI School of Education

PI: Fernando Rodriguez Ph.D., Lindsey Richland Ph.D.

- Write and submit a funding proposal for a research project investigating the relationship between math anxiety and mind wandering of college students with both causal inference models and modern machine learning tools.
- Construct survey with appropriate measures for both math anxiety, mind wandering, and other relevant factors which will be administered during the winter quarter to collect data for modeling.

PROFESSIONAL PROJECT

Anime Genre Predictor and Recommendation Engine

Code 

- Developed a predictive model using *Scikit-learn LogisticRegression* with *Python* to forecast anime genres based on reviews and airing time.
- Implemented an anime recommendation system with *cosine similarity algorithm*, providing personalized anime recommendations based on user preferences and viewing patterns.

SELECTED TALKS AND PRESENTATIONS

Upcoming Talk

Cervantes E. & Tran J. (2024, January). A Greedy Approach to Kaczmarz Method with Oblique Projections. Presenting at Joint Mathematics Meetings. San Francisco, CA.

Submitted Presentation

Cervantes E. (2024, March). Exploring mind wandering and situational interest as mechanisms for how math anxiety negative math learning and understanding across genders. Submitted to Cognitive Development Society. Pasadena, CA.

Poster Presentations

Cervantes E. & Ma S. (2023, June). Effectiveness of Worked Examples on Reducing Math Anxiety. Presented at Working Memory and Plasticity Lab Symposium. Irvine, CA.

Cervantes E. & Ma S. (2023, May). Effectiveness of Worked Examples on Reducing Math Anxiety. Presented at Annual Undergraduate Research Symposium. Irvine, CA.

Cervantes E., Davityan M., Halabi A., Truong J., Wu M. (2022, August). Impact of Mediterranean and DASH Diets on MPN Symptoms. Presented at Project RAISE Summer Research Symposium. Fullerton, CA.

Cervantes E., Davityan M., Halabi A., Truong J., Wu M. (2022, August). Impact of Mediterranean and DASH Diets on MPN Symptoms. Presented at SoCal Data Science Fellowship Symposium. Irvine, CA.

INVOLVEMENTS

Data @ UCI — UC Irvine

Feb 2022 - Present

Executive Vice President

Jun 2023 - Present

- Coordinate all aspects of event logistics including venue selection and vendor management.
- Facilitate meetings with industry and university executives to discuss potential partnerships and collaborations.

Vice President of Logistics

Feb 2022 - Jun 2023

- Created and led technical workshops on building data visualizations with R.
- Reached out to sponsors to establish partnerships and managed all logistics aspects for UC Irvine's first inaugural Datathon, a Data Science hackathon.

Undergraduate Mathematics Committee — UC Irvine

Jun 2023 - Present

Co-founder, President

- Co-founded the organization to expand and foster a welcoming community for undergraduate math majors at UC Irvine.
- Write funding proposal for securing and improving new study lounge for undergraduate math majors.

Faces in Mathematics — UC Irvine

Feb 2022 - Jun 2023

External Vice President

Jun 2022 - Jun 2023

- Invited a professor to deliver a keynote speech and alumni to participate in the Faces in Mathematics industry conference.
- Managed study room for members and hosted workshops to support lower-division math majors in constructing their four-year college plan.

Director of Professional Development

Feb 2022 - Jun 2022

- Initiated and executed the first inaugural Faces in Mathematics conference at UC Irvine.
- Established and maintained connections with industry and the Department of Mathematics at UC Irvine for conference and general meetings.

TEACHING EXPERIENCE

Classroom Leader, Mentor — Math CEO

Jun 2022 - Present

- Instruct math topics and lead classroom activities for Math CEO sessions, an after-school math tutoring program for underserved communities in Orange County, CA.
- Develop and execute weekly lesson plans that incorporate math concepts and their relevance to social justice issues.

Learning Assistant — UC Irvine

Jun 2022 - Present

- Mentor undergraduate students on curriculum planning and pedagogical tactics in Math 192 (Studies in the Learning and Teaching of Secondary Mathematics).
- Maintain regular communication with program directors and co-learning assistants, providing detailed reports on each lesson, and offering recommendations for future activities.

SKILLS

Computer R: tidyverse, lme4, laavan, Quarto
Python: NumPy, pandas, Matplotlib, scikit-learn, PyTorch, TensorFlow
MATLAB: Scientific computing, scripting, data visualization
L^AT_EX: Document preparation, beamer, bibliography, mathematical notation

Language English (fluent), Japanese (native speaker)

CERTIFICATIONS

Human Subjects Research (HSR) Training for Social & Behavioral Investigators, Collaborative Institutional Training Initiative (CITI Program)	Dec 2023
Certified Learning Assistant Program (CLAP), UC Irvine	Mar 2023
SQL - MySQL for Data Analytics and Business Intelligence, Udemy	Sep 2021