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Paulina Rodriguez

Education

Ph.D. Mechanical and Aerospace Engineering, The George Washington University (GWU), Washington, DC 2025
M.S. Mathematics, Claremont Graduate University (CGU), Claremont, CA 2012
B.A. Mathematics, University of California Santa Cruz (UCSC), Santa Cruz, CA 2010

Relevant Research

Sandia National laboratories Albuquerque, New Mexico
Visiting Scientist, Computational Science Graduate Fellowship 2022

- Conducting UQ, validation metrics, and implementing NGW/IWF process to existing ablation project.

The George Washington University (GWU) Washington, DC
Graduate Student, Computational Science Graduate Fellowship 2021 - Current

- Computational model of an electronic drug delivery system using open source software and integrating reproducibility into credibility activities. Conduct verification of computational model.

US Food and Drugs Administration (US FDA) Silver Spring, MD
Regulatory Science Researcher, ABioM Project 2017 - 2021

- Developed a computational model of a medical device, electronic drug delivery system, using ANSYS CFX and integrated validation, risk assessment, and applicability to demonstrate how to build credibility into the model.

Regulatory Science Researcher, SimSight Project 2020

- Developed a python script with a jupyter notebook to search publicly available 510(k) and Premarket Application submissions for modeling relevant content.

Claremont Graduate University (CGU) Claremont, CA
Graduate Student, Coffee Ring Effect Analysis 2012

- Verified numerical solutions of a drying droplet containing moving particles with analytic methods.

Graduate Student, Allergens Microarray Data Analysis 2011

- Analyzed a small sample of dust mite allergens microarray genetic data using Bayesian statistics and R.

Graduate Student, Solar Chimney Optimization 2011

- Developed a solar chimney model using Matlab for the Environmental Design Group as an alternative HVAC.

National Institute of Genomic Medicine (INMEGEN) Mexico City, Mexico
Graduate Researcher, Neurocysticercosis Data Analysis 2011

- Analyzed small sample Neurocysticercosis microarray genetic data using Bayesian statistics and R for geneticists. Trained an undergraduate student, delegated workload, and presented results (Spanish/English).

Institute for Pure and Applied Mathematics, UCLA Los Angeles, CA
Undergraduate Research Assistant, Orbit Transfer Optimization 2009

- As a Research in Industrial Projects for Students (RIPS) summer student, collaborated with 4 students and The Aerospace Corporation to optimize orbit transfers through simulations programmed in C.

University of California, Santa Cruz (UCSC) Santa Cruz, CA
Undergraduate Research Assistant, Hamiltonian Systems Analysis 2008 - 2009

- Assessed analytical methods for Hamiltonian system applications.

WORK

Research Scientist, US FDA, Silver Spring, MD 2017 - 2021

- Developed regulatory science research tools for building modeling and simulation (M&S) credibility for medical devices. Reviewed grant proposals, shadowed the regulatory review process, and participated in the M&S working groups and programs. Managed a team of 6 and a team of 4 research scientists using an Agile framework and project management

tools.

Senior Web Developer, Search Influence, New Orleans, LA 2015 - 2017

- Improved data collection accuracy for 20-30 Google Analytics and Tag Manager accounts. Search engine optimized 40-50 websites on 10 website editors with custom HTML, CSS, and JavaScript.

Tutor Coordinator, Learning Support Services at UCSC, Santa Cruz, CA 2014

- Daily maintained tutor database and website. Analyzed utilization data to identify 158 courses requiring tutors. Hired, trained, and assessed 250 tutors. Managed 12 student assistant workers and tutored math.

Program Assistant and Student Advisor, California Teach Program at UCSC, Santa Cruz, CA 2013 - 2014, 2015

- Made payments, organized events, advised undergraduates, and developed a relational database for 7 years of survey data. Electronically streamlined paper applications and screening. The remodeled website increased new visits by 18.5%, pages visited/session by 65%, and the average session duration by 375%.

Contract Tutor, Youth Policy Institute, Los Angeles, CA 2013

- Taught 11 students, grades 1-7, in a 5 month period on English Language Arts and Mathematics. Using a self-prepared curriculum, 95% of the students improved test scores. (Los Angeles Unified District)

Mathematics Department Tutor, Learning Support Services, UCSC, Santa Cruz, CA 2009

- Self-prepared one-on-one tutoring sessions for 8 undergraduate mathematics courses. Students (100%) who came in for tutoring passed their math course. (Average 10-15 students/ 3hr session)

Co-Leader & Tutor, Academic Excellence Program (ACE), Santa Cruz, CA 2007 - 2010

- Taught precalculus and calculus to 15-20 STEM students. On average 95% passed their math course.

Teaching and Volunteering

Annual STEM Day at Annapolis Middle School, Annapolis, MD 2022
Subject Matter Expert, US FDA Digital Transformation OCR Search Capabilities, Silver Spring, MD 2020
Participant, US FDA CDRH's Experiential Learning Program, Dassault Systèmes, Waltham, MA 2019
Volunteer, USA Science & Engineering Festival: US FDA Booth, Washington, DC 2018
Founder and Secretary, DC SACNAS Chapter, Washington, DC 2018
Volunteer, UNIDOS US: Hands-On Science Booth, Washington, DC 2018
Lead, Tech Talent South New Orleans: Kids Code New Orleans, New Orleans, LA 2016
Founder and President, SACNAS at the Claremont Colleges Chapter, Claremont, CA 2012
Council Member, Graduate Student Council, Claremont, CA 2011 - 2012
Tutor and Teaching Assistant, Harbor High School, Santa Cruz, CA 2010
Cal Teach Intern, California Teach (Cal Teach) Program at UCSC, Santa Cruz, CA 2008 - 2009
Mentor and Assistant Presenter, Expanding Your Horizons Conference, Santa Cruz, CA 2007 - 2008

Conferences, Awards, and Associations

Super Computing (SC 2022) Conference, *Attended* 2022
DOE CSG Annual Program Review, ***Presented*** 2022
DOE Computational Science Graduate Fellowship (CSGF), ***Awarded*** 2021 - Current
ASME Student Member 2022 - Current
7th & 8th Annual FDA Scientific Computing Days, *Attended* 2019, 2020
US FDA Outstanding Service Award, ***Awarded*** 2019
ASME, V&V Symposium, *Attended, Presented* 2018, 2019, 2020
BMES/FDA Frontiers in Medical Devices Conference, *Attended* 2017, 2019
Collision, *Attended* 2016
MSRI, Spring Opportunities, *Attended* 2012
Infinite Possibilities Conference, *Attended, Presented* 2011
Society for Industrial and Applied Mathematics (SIAM), *Member* 2010 - 2015
Claremont Graduate University Math Tuition Fellowship, ***Awarded*** 2008 - 2010
Koret UC LEADS Symposium, *Attended, Presented,* ***Awarded Poster Recognition*** 2008 - 2010

CAMP, *Attended, Presented,* ***Awarded Poster Recognition***	2009 - 2010
UCSC Undergraduate Symposium, *Presented*	2009 - 2010
American Mathematical Society (AMS), *Member*	2009 - 2015
Association for Women in Mathematics (AWM), *Member*	2009 - 2015
SACNAS Video Presentation for Student Tutorial, *Presented,* ***Awarded***	2009
SACNAS Travel Scholarship for National Conference, *Attended, Presented*	2008, 2009, 2011, 2012
SACNAS, *Member*	2008 - Current
Academic Excellence Program (ACE), *Participant*	2007 - 2010
Educational Opportunity program (EOP), *Participant*	2006 - 2010

Publications & Presentations

Rodriguez, P., Sarmakeeva, A., Barba, L., “Comparing Open-Source and Commercial Software Solvers for Hagen-Poiseuille Flow”, DOE CSGF Annual Program Review, 2022. Poster.

Sarmakeeva, A., Rodriguez, P., Barba, L., “Verification of Open-Source and Commercial Numerical Solvers for Hagen-Poiseuille Flow”, SEAS Student Research & Development Showcase, 2022. Poster.

Rodriguez, P., “Agile for Biomedical Modeling (ABioM)”, US FDA Presentation, 2019. Webinar.

Rodriguez, P., Dibaji, A, Murray, B., Myers, M., Pathmanathan, P., Morrison, T., “A Management Framework for Supporting Adaptive and Iterative VVUQ Efforts in Biomedical Modeling”, ASME V&V Symposium, 2019. Podium Presentation

Rodriguez, P., Dibaji, A, Murray, B., Myers, M., Morrison, T., “An Agile Verification and Validation Process for Generating Regulatory-Grade Evidence”, ASME V&V Symposium, 2018. Podium Presentation

Fanger, M., Rodriguez, P., Talacay, L., Takmakov, P., Morrison, T. , “SimSight: Data Mining to Determine the Role of Computational Modeling and Simulation in Regulatory Decisions for Marketed Devices”, US FDA Summer Fellow Scientific Poster Day, 2019. Poster

Peterson, G.E., Campbell, E.T., Balbas, J., Ivy, S., Merkurjev, E., Rodriguez, P., "Relative Performance of Lambert Solvers 1: 0-Revolution Methods, Adv Astronaut Sci", 136 (1), pp. 1495-1510, presented at 20th AAS/AIAA Space Flight Mechanics Meeting, San Diego, CA, February 14-17, 2010

Rodriguez, P., Castaño, K., Rangel-Escareño, C., “High Feature-to-Sample Ratio Neurocystercosis Data Set in Gene Expression Microarray Analysis”, SACNAS National Conference, 2011. Poster

Rodriguez, P., Ivy, S., Merkujev, E., Hall, T., Balbas, J., “Implementing and Comparing Lambert Solvers for Trajectory Design Studies and Space Mission Analyses'', Koret UCLEADS Symposium, 2010, CAMP Symposium, 2010, SACNAS National Conference, 2009. Poster

Rodriguez, P., Villaron, M., Lewis, D., “Hamiltonian Systems and their Application to Dynamical Waves and Fluids”, NCUR, 2009, Koret UCLEADS Symposium, 2009, CAMP Symposium, 2009, SACNAS National Conference, 2008. Poster

Peterson, G.E., Campbell, E.T., Balbas, J., Ivy, S., Merkurjev, E., Rodriguez, P., "Relative Performance of Lambert Solvers 1: 0-Revolution Methods, Adv Astronaut Sci", 136 (1), pp. 1495-1510, presented at 20th AAS/AIAA Space Flight Mechanics Meeting, San Diego, CA, February 14-17, 2010

LANGUAGES

English
Spanish

TECHNOLOGIES SUMMARY

Programming Languages: Python, R, C++, C, Octave, PHP, JavaScript, Markdown, CSS, HTML
Operating Systems: Windows, Linux, MacOS, UNIX
Database Management: Postgres, MySQL
Parallelization Methods: MPI, OpenMP
Software: Git, MATLAB, LaTeX, ANSYS, OpenFOAM, Jupyter, RubyonRails
Text Editors: Vim, Nano, Sublime, Emacs, VSCode