ANTHONY MEZA

ameza@mit.edu | github.com/anthony-meza | Woods Hole, MA

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA — *September 2021 - Present*
Ph.D. in Physical Oceanography — **Overall GPA:** 4.9

University of California, Irvine, Irvine, CA — *September 2018 - June 2021*
B.S. in Mathematics, *Summa Cum Laude* — **Overall GPA:** 3.94
Concentration in Data Science

Fullerton College, Fullerton, CA — *February 2016 - May 2018*
A.S. in Mathematics — **Overall GPA:** 3.72

RESEARCH EXPERIENCE

Woods Hole Oceanographic Institution — *September 2021 - Present*
Graduate Student Researcher
Primarily Advised by Dr. Geoffrey Gebbie

- Connecting observations and models to better understand decadal deep ocean variability in heat content, circulation, and tracer concentrations
- Using reanalyses, observations and models to understand how near-shore intraseasonal sea surface temperature variability influences precipitation
- Tools used in research include the Julia and Python programming languages as well as the MITgcm and MOM6 ocean models

Los Alamos National Laboratory — *June 2021 - August 2022*
Parallel Computing Summer Fellow
Advised by Dr. Mark Petersen

- Implemented reduced-precision capability in the Energy Exascale Earth System Model
- Found that reduced precision marginally reduced compute time (i.e. energy consumption), but was outweighed by the fact that floating-point error reduced model skill

University of California, Irvine — *October 2020 - June 2021*
Undergraduate Research Assistant
Advised by Dr. Francois Primeau

- Contributed to the development of a zonally integrated Atlantic Meridional Overturning Circulation model by adding linear and non-linear equations of state
- Explored the steady states in the model associated with various patterns of freshwater forcing using the Julia programming language

Institute for Pure and Applied Mathematics &
The Aerospace Corporation — *June 2020 - September 2020*
Undergraduate Research Assistant
Research in Industrial Projects for Students

- Developed a general dynamic network model using Python using NetworkX
- Implemented and tested the viability of using reinforcement algorithms, Q-learning and Deep Q-learning, to improve packet routing performance on a dynamic network using OpenAI Gym and PyTorch
- Provided multiple reports and weekly presentations throughout the summer to inform industry mentors

University of California, Irvine *March 2020 - June 2020*
Undergraduate Research Assistant
Advised by Dr. Anna Ma

- Studied various iterative methods for solving linear equation systems such as: Randomized Kaczmarz Method (RK), Sampling Kaczmarz Motzkin (SKM) and Motzkins Method (MM)
- Implemented the SKM and MM algorithms in MATLAB
- Compared SKM and MM for scalability and performance.
- Produced a written report discussing and analyzing these results

University of California, Irvine *July 2019 - August 2019*
MathBioU REU Researcher
Advised by Dr. Xing Dair

- Interpreted and visualized single-cell RNA-sequencing data using Seurat, an R package
- Identified several fibroblast subpopulations and their functions through analysis of their gene expression using principal component analysis
- Mentored high school students interested in pursuing undergraduate study related to mathematics and computation
- Presented research at the conclusion of the MathBioU program

University of California, Irvine *March 2019 - June 2019*
Undergraduate Research Assistant
Advised by Dr. Nicole Fider

- Worked in a team of three undergraduate students to formulate meaningful metrics to measure differences in color perception using data provided by the World Color Survey under the supervision of Dr. Nicole Fider
- Visualized relationships among colors using Principal Component Analysis in MATLAB

Old Dominion University *June 2018 - August 2018*
Undergraduate Research Assistant
Advised by Dr. John Klinck

- Used Python packages NumPy, SciPy and Pandas to read and analyze environmental data collected from the Lafayette River
- Applied statistical and signal processing tools to gain an understanding of the physical controls on local phytoplankton population

PRESENTATIONS

A. Meza, P. Bhuyan, Z. Zheng, G. Gebbie. "Surface to Bottom Connections in Earth's Ocean" Tracer Mixing in Fluids Across Planetary Scales Summer School, 8–19 July 2024, Brin Mathematics Research Center, College Park, MD. *Talk.*

A. Meza, H. Seo. "Associations Between Coastally Trapped Waves and Wintertime Precipitation in California" Ocean Sciences Meeting, 18–23 February 2024, New Orleans, LA. *Poster.*

A. Meza, H. Seo. "Associations Between Coastally Trapped Waves and Wintertime Precipitation in California" Graduate Climate Conference, 1–3 November 2023, Marine Biological Laboratory, Woods Hole, MA. *Poster.*

A. Meza, G. Gebbie. "Drivers of subsurface Pacific cooling in ECCOv4r4" ECCO Annual Meeting 2023, 25 January 2023, University of Washington, Seattle, WA. *Virtual Talk.*

A. Meza, G. Gebbie. "Drivers of mid-depth Pacific cooling trends in an ocean reanalysis" AGU Fall Meeting 2022, 2–4 November 2023, Chicago, IL. *Poster.*

A. Meza, G. Gebbie. "Drivers of mid-depth Pacific cooling trends in an ocean reanalysis" Graduate Climate Conference, 31 October 2022, University of Washington, Seattle, WA. *Poster.*

C. Tran, **A. Meza**, H.L. Tung, H. Liu. "A Reinforcement Learning Approach to Packet Routing on a Dynamic Network" Joint Mathematics Meeting, 6-9 January 2021, Virtual. *Virtual Talk.*

SERVICE AND LEADERSHIP

High Performance
Data Analysis Workshop *October 2024*
Co-orgnizer and instructor

Summer Math Refresher *July 2024*
Calculus Instructor

WHOI Joint Program
Student Representative *August 2023 - Present*
Physical Oceanography Representative

Summer Math Refresher *July 2023*
Partial Differential Equations Instructor

Joint Program Applicant Support & Knowledgebase *August 2023 - December 2023*
Mentor

2023 Graduate Climate Conference *January 2023 - November 2023*
Co-Organizer

WHOI Joint Program Student
Representative *August 2022 - August 2023*
At-Large Representative

2022 First Generation Summit *June 2022 - November 2022*
Co-Organizer

Mathematics Inclusive Excellence Committee *August 2020 - May 2021*
Committee Member

AWARDS AND HONORS

National Consortium of Graduate Degrees for Minorities in Engineers Graduate Fellowship, Massachussets Institute of Technology, 2021

Rose Hills Foundation Undergraduate Science & Engineering Scholarship, UC Irvine, 2020

Rose Hills Foundation Undergraduate Science & Engineering Scholarship, UC Irvine, 2019

Maria Rebecca and Maureen Bellettini Scholarship, UC Irvine, 2019

Southern California Edison STEM Transfer Scholarship, UC Irvine, 2019

TECHNICAL SKILLS

Proficient in Linux, Python, MATLAB, Julia, C++, and LaTeX