Paula Navarrete

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Education

University of Massachusetts Amherst. Ph.D. in Computer Science — Amherst, MA
Advisor: Yair Zick. GPA: 4.0 — 2022 –Expected: 2027
Coursework: Advanced Algorithms, Advanced Natural Language Processing, Artificial Intelligence, Game Theory and Fairness, Database Design and Implementation, Probabilistic Graphical Models.

Pontifical Catholic University of Chile (PUC). M.S. in Engineering — Santiago, Chile
Advisor: Rodrigo Cienfuegos. GPA: 3.89 — 2016 –2019
Thesis: Assessment of the tsunami forecast capacity using sea surface data assimilation [J3]

Pontifical Catholic University of Chile (PUC). B.S. in Mathematical Engineering — Santiago, Chile
GPA: 3.64 — 2012 –2016
Relevant Coursework: Linear Algebra, Stochastic Models, Probabilities Theory, Statistical Inference, Regression Analysis, Discrete Mathematics, Multivariate Calculus, Simulations, Optimization under uncertainty, Time series, Real Analysis.

Research and Industry Experience

Graduate Research Assistant. University of Massachusetts Amherst — Feb 2024 – Present
Designing, implementing and analyzing fair and efficient allocation algorithms — Amherst, MA
- Working on the course allocation [W1] and chore division problems
- Analyzing time complexity and theoretical guarantees
- Collecting and analyzing real data, and running simulations based on it

Data Science Intern. Data Science for the Common Good program (DS4CG) — May 2024 – Sept 2024
Developed web based annotation tool to improve iNaturalist species range predictions — Amherst, MA
- Developed frontend and backend of web application
- Implemented feeatures to retrieve predictions from iNaturalist SINR Geomodel and display them in interactive map
- Designed and implemented database to store and retrieve species predictions and expert annotations

Data Scientist. PUC Energy and Complex Systems Lab — Jun 2021 – Jul 2022
Project lead on short and long term time series forecasting for solar energy and electric demand — Santiago, Chile
- Developed and integrated forecasting tool to the backend of solar operation management software
- Coauthored journal publication on MDP model for optimal solar farm cleaning scheduling [J1]

Project Engineer. Public Funding Research Project — Dec 2019 – May 2021
Developed new techniques for non-seismic data based Tsunami forecasting — Santiago, Chile
- Formulated Bayesian inference approach for tsunami source reconstruction through an inverse problem
- Achieved state of the art tsunami forecasts by relying in sea surface observations rather than seismic data

Researcher. Research Center for Integrated Disaster Risk Management (CIGIDEN) — Mar 2019 – May 2021
Researched on Near-Real time Tsunami forecasting — Santiago, Chile
- Built PCA algorithm to select and cluster candidate tsunami observation points.
- Implemented near-real time data assimilation algorithm for tsunami forecasting
- Developed heuristic to select optimal observation network
- Achieved state of the art forecasts with only 3 additional observation stations
- Authored journal publication [J3] and coauthored two related publications [J2,J4]

Research Fellow. Earthquake Research Institute (ERI), University of Tokyo — Oct 2017 – Nov 2017
Supervisor: Kenji Satake — Tokyo, Japan
Research on Empirical Orthogonal Functions and Data Assimilation for tsunami forecasting

Publications and Academic Works

[W1] **P. Navarrete**, C. Cousins, G. Bissias and Y. Zick. 2024. Deploying Fair and Efficient Course Allocation Mechanisms. In Incentives of Academia Workshop of the 25th ACM Conference on Economics and Computation (EC'24).

[J1] M. González-Castillo, **P. Navarrete**, T. Tapia, Á. Lorca, D. Olivares, and M. Negrete-Pincetic. 2023. Cleaning scheduling in photovoltaic solar farms with deterministic and stochastic optimization. Sustainable Energy, Grids and Networks, vol. 36, p. 101 147, 2023.

[J2] Y. Wang, H. Tsushima, K. Satake and **P. Navarrete**. 2021. Review on recent progress in near-field tsunami forecasting using offshore tsunami measurements: Source inversion and data assimilation. Pure and Applied Geophysics, pp. 1–20.

[J3] **P. Navarrete**, R. Cienfuegos, K. Satake, Y. Wang, A. Urrutia, R. Benavente, P. Catalán, J. Crempien and I. Mulia. 2020. Sea surface network optimization for tsunami forecasting in the near field: Application to the 2015 illapel earthquake. Geophysical Journal International, vol. 221, no. 3, pp. 1640–1650.

[J4] Y. Wang, K. Satake, R. Cienfuegos, M. Quiroz and **P. Navarrete**. 2019. Far-field tsunami data assimilation for the 2015 illapel earthquake. Geophysical Journal International, vol. 219, no. 1, pp. 514–521.

[C1] **P. Navarrete**, R. Cienfuegos and K. Satake. 2018. Assessment of the tsunami forecast capacity using sea surface data assimilation: The 2015 Illapel Earthquake. III Engineering UC-USM Congress. Santiago, Chile.

Teaching Experience

Teaching Assistant. University of Massachusetts Amherst — Fall 2022 –Spring 2024
Introduction to Computation, Reasoning Under Uncertainty, Artificial Intelligence

Teaching Associate. University of Massachusetts Amherst — Fall 2023
Introduction to Python

Adjunct Faculty. Pontifical Catholic University of Chile — Spring 2020 –Spring 2022
Head instructor of Stochastic Models (Poisson processes, MDPs, Queueing theory, Simulation)

Teaching Assistant. Pontifical Catholic University of Chile — Spring 2013 –Fall 2018
Calculus, Linear Algebra, Marketing, Stochastic Models

Other Academic Activities

• Invited to the Dagstuhl seminar on 'Fair Division: Algorithms, Solution Concepts, and Applications' (2024), Wadern, Germany.

• One of the selected speakers at the Incentives of Academia Workshop of the 25th ACM Conference on Economics and Computation (EC'24), for the work titled "Deploying Fair and Efficient Course Allocation Mechanisms" in collaboration with C. Cousins, G. Bissias and Y. Zick.

• Poster presenter at the Columbia Workshop on Fairness in Operations and AI. Columbia University, New York, 2023, on the work titled "Efficient Yankee Swap for Fairly Allocating Courses to Students" with C. Cousins, V. Viswanathan and Y. Zick.

• Received PUC School of Engineering Letter of Recognition for Outstanding Teaching, 2022.

• Awarded Most Inspiring Professor of the Industrial and Systems Engineering Department, 2020.

• Received JASSO Grant for exchange students in Japan, 2017.

Skills

Programming: Python, SQL, MATLAB, C#, Java, Bash, LaTeX, R, Excel
Libraries: NumPy, Pandas, Networkx, Matplotlib, Pytorch.