FABIANA FERRACINA

Contact

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Qualifications

- Experience teaching analytic and technical topics to people of diverse background, as well as working in a technical corporate environment
- Demonstrated ability to work with engineers and help manage software development projects pertaining to business needs
- Knowledge of Java, MatLab, Python, R, SAS, JavaScript as well as HTML, CSS and LaTeX
- Detail-oriented with strong analytic and problem solving skills; passion for learning new skills and improving old ones
- Comfortable using Linux command line; familiarity with revision systems such as git
- Proficient with data analysis using various tools, such as Excel, Python and R
- International experience and cultural sensitivity; fluency in English and Portuguese

Education

Washington State University, Vancouver
Vancouver, WA
Ph.D. in Statistical Science, June, 2024
Thesis title: "Trials, Turbulations, and Inferences of ML on Complex data: Potato Varieties, Simulated Clouds, and More"
Overall GPA of 3.92

University of Washington
Seattle, WA
M.S. in Mathematics, June, 2012
Optimization Specialization
Overall GPA of 3.63

University of Rochester
Rochester, NY
B.S. in Mathematics, May, 2006
General Liberal Arts Education
Overall GPA of 3.86

Internships

Pacific Northwest National Laboratory, Richland, WA
PhD Intern - Data Sciences & Machine Intelligence *January, 2023 - May, 2024*

- Worked remotely with the data science team and domain experts at PNNL on applications of graph neural networks
- Investigated reduced models of aerosol particle-size distributions, as well as developed machine learning models of aerosol particle dynamics
- Investigated the addition of topological descriptors to graph network simulators in order to improve efficiency and performance

Tohoku University through IPAM UCLA, Sendai, Japan
Graduate Student Intern in Summer Program *June, 2022 - August, 2022*

- Selected to participate in UCLA IPAM's Graduate-level Research in Industrial Projects for Students (G-RIPS) at Tohoku University in Sendai
- Worked with F-MIRAI research center at University of Tsukuba and Toyota on mathematical approaches for mobility services in suburban areas
- Worked full time with three peers on developing and implementing a queue based model to study traffic congestion and gas emissions due to congestion

Assistantships

Washington State University, Vancouver, WA

Graduate Student and Teaching Assistant *August, 2018 - December, 2022*

- Taught and developed materials for Calculus and Statistics courses at WSU Vancouver, as well as participated in interdisciplinary research involving mathematics, statistics, biology and computer science topics
- Worked closely with faculty from various departments to forward knowledge and research in science and mathematics
- Researched time-series data analysis, topological data analysis, state space models, hidden Markov models and Bayesian statistics

University of Washington, Seattle, WA

Graduate Student and Teaching Assistant *August, 2010 - June, 2012*

- Focused major on Optimization and Numerical Analysis with a curriculum involving classes from both the Mathematics and the Applied Mathematics departments; participated on Combinatorial Optimization research
- Held two weekly Calculus sessions every quarter, ranging from Basic to Advanced
- Assisted students in person and email; graded exams and homework consistently and promptly

Work Experience

Tohoku University through IPAM UCLA, Sendai, Japan

Academic Mentor *June, 2024 - August, 2024*

- Provides project guidance and academic mentorship to group of graduate students
- Works with program director, industry mentors and other academic mentors to ensure students have the proper resources to succeed in their project
- Assists with interactions between students and mentors of diverse cultural backgrounds

University of Washington, Bothell, WA

Math and CS Lecturer *June, 2013 - December, 2016*

- Taught and developed materials for Computer Science courses at the University of Washington, Bothell, such as Java programming and functional programming in Scala
- Developed novel Scientific Computing class, as well as developed new teaching and testing materials for existing programming and mathematics classes
- Worked closely with faculty and program directors on improving the quality and accessibility of technical education to a diverse population of students

Google Inc, Mountain View, CA

Finance Operations Analyst *March, 2007 - July, 2009*

- Managed several projects pertaining to the automation of data collection/reporting
- Performed data analysis and created reporting for executive management using Excel and Python
- Worked with engineers in adding new features and enhancing internal tools pertaining to travel and expenses

Academic Articles

- Ferracina, F., Krishnamoorthy, B., Halappanavar, M., Hu, S. and Sathuvalli, V.,

2024. *Predictive Analytics of Varieties of Potatoes.* preprint: `https://arxiv.org/abs/2404.03701` and associated code: `https://github.com/fabstat/burbank`

- Nakamura, A., Ferracina, F., Sakata, N., Noguchi, T., Ando, H., *Reducing Total Trip Time and Vehicle Emission through Park-and-Ride – methods and case-study.* To be submitted to the Journal of Cleaner Production in Summer 2024.
- Ferracina, F., Beeler, P., Krishnamoorthy, B., Minutoli, M., Halappanavar, M., Fierce, L., *Simulating Aerosol Interactions and Chemistry with Graph Neural Networks.* Work in progress, to be submitted to the Aerosol Science and Technology journal in Fall 2024.
- De Pasquale, G., Ferracina, F., Hardenbrook, R., Luo, J., Lynch, M., Mori, J.C.M., Nelson, A., Porter, M.A. and Thompson, W., *Persistent Homology for Assessing Facility Placement.* Presented in the 2024 Joint Mathematics Meetings (JMM 2024), in progress and to be submitted in late 2024.

Activities & Projects

- Presented work on *Simulating Aerosol Chemistry with Graph Neural Networks* at the 8th Cascade RAIN Meeting
- Participated in the 2023 AMS-MRC Conference week on Complex Social Systems, where I worked in a team to solve the fair facility location problem using persistent homology
- Conducted Applied Statistics review sessions for graduate students preparing to take the graduate qualifying exam
- Provided internal review for USGS paper
- Participated and was awarded 3rd place in WSU Vancouver's 3MT Spring 2021 competition
- Course paper and presentation - The Ontogeny of Bald Eagle Behavior (Fall 2020)
- Course paper and presentation - Modeling Presence-Only Data: a Hierarchical Exploration of the Oceanic Whitetip Shark Distribution (Fall 2020)
- Course paper and presentation - A Hidden Markov Connection: Quantifying Neuronal Spikes and Forest Fires (Spring 2020 with Jacob Pennington)
- Course paper and presentation - Modeling Changes in Symbiotic Nitrogen Fixing and Ecosystem Function due to Human Activity (Spring 2020)
- Course paper and presentation - On Bayesian Species Occurrence Modeling Research: a Reproducibility and Adaptability Review (Fall 2019 with Christopher Custer and Roxanne Lindgren)
- Course paper and presentation - SparkulAkka: a Simple and Extensible Distributed Simulation System built on Spark and Akka (Spring 2019)

Teaching Experience

I have many years of experience teaching mathematics, statistics and computer science. Besides lectures and lab guidance, I have worked on developing teaching and testing materials for each subject. I have experience teaching both in class and remotely online:

- WSU MATH 106: College Algebra (class)
- WSU MATH 140: [QUAN] Calculus for Life Scientists (both class and labs)
- WSU MATH 171: [QUAN] Calculus I (both class and labs)
- WSU STAT 212: [QUAN] Introduction to Statistical Methods (class)
- WSU STAT 360: Probability and Statistics (class)
    - My reveal.js slides
- WSU STAT 380: [M] Decision Making and Statistics (grading)

- WSU Quantitative Skills Center Math, Stats and R Tutoring
- UW Bothell BCUSP 122/123: Functions, Models, and Quantitative Reasoning
- UW Bothell BCUSP 124/125: Calculus I and II
- UW Bothell BCUSP 127: Learning Strategies in Mathematics
- UW Bothell CSS 161/SKL 161: Fundamentals of Computing (class and lab)
    - Wrote high quality lab and testing materials using Java
- UW Bothell CSS 162: Programming Methodology
- UW Bothell CSS 490 Electives: Introduction to Functional Programming; and Elements of Scientific Computing (designed and taught)

Interests

Academic: Optimization, state-space models, mixed models, topological data analysis, graph neural networks, future changing technology
Personal: Watercolor painting, baking, reading science fiction, learning Japanese