Nathan Whybra

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Summary

I am a Mathematician with a strong background in algorithms, data science, software development, and teaching. I have experience in R&D for robot-assisted optical manufacturing, designing algorithmic solutions and developing software tools. Skilled in Python, MATLAB, C++, Unix, CUDA, TensorFlow, and PyTorch. I have hands on technician experience in optical coatings and and optical manufacturing.

Education

University of Washington, Seattle, WA
M.S. in Applied Mathematics June 2025
Fully funded by a Teaching Assistantship
Coursework in *Numerical Methods, Machine Learning, Computational Modeling, C++ for Scientific and Parallel Computing*

University of Rochester, Rochester, NY
B.S. in Mathematics with Honors, Minor in Physics May 2022
Coursework in *Advanced Mathematics, Data Structures and Algorithms, Data Analysis, Quantum Physics/Computing, Thermodynamics*

Experience

Adjunct Faculty Instructor, College of Charleston August 2025 – November 2025

- Instructed *MATH 104: Elementary Statistics* in the Fall semester of 2025 at the College of Charleston. I did in person lectures, made homework assignments and exams, held office hours, and spent 4 hours per week tutoring.
- My instruction was apart of the PhD requirements at the College of Charleston, but due to personal reasons I quit at the end of the semester.

Software and Algorithms Engineer, Optimax Systems, Inc. May 2023 – June 2025

- Designed and implemented algorithmic solutions for precision optical fabrication using robotic arms, deploying software packages in Python and MATLAB to production environments. Familiarity with ROS (Robot Operating System).
- Optimized a manufacturing algorithm, reducing runtime from nearly an hour to on the order of seconds to minutes, enabling integration into production workflows.
- Collaborated with engineering teams to translate mathematical models into scalable software.

Teaching Assistant, University of Washington September 2024 – June 2025

- Held workshops and coding labs, graded assignments, proctored exams, and held weekly office hours for *AMATH 301: Beginning Scientific Computing*, *MATH 125: Integral Calculus*, and *MATH 126: Multivariable Calculus*.
- My instruction was apart of a Teaching Assistantship which funded my Masters Degree.

Optical Coating Technician, Optimax Systems, Inc. December 2021 – May 2023

- Working in a clean-room environment, I ran and performed maintenance on optical coating chambers; including vacuum chambers and ion-beam chambers.

Research Assistant, University of Rochester Summers 2020, 2021, 2023

- I participated in the *STEMForAll REU in Data Science*, collaborating with faculty and student teams on summer projects involving statistical analysis and scientific computing. Projects included building neural networks from scratch in Python, using TensorFlow and PyTorch neural network models to learn fractal curves, making multi-task learning models, studying image processing techniques, and predicting future sales prices using LSTM networks.

Publications

- Jennifer Coniglio, Daniel R. Brooks, Steve Murty, Nate Whybra, Brittany Cox, Brian Myer, Brendan McDermott, Mike Hyman. "Advancements in robotic smoothing of high precision optics." *Proceedings Volume 13100, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation VI;* 131000E, SPIE Astronomical Telescopes + Instrumentation, Yokohama, Japan, August 26, 2024. DOI: 10.1117/12.3018030.