

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, TensorFlow, and PyTorch. I have hands on technician experience in optical coatings 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

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.