Erick G. Ruiz
Software Engineer, Applied Mathematician, Physicist

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Professional Experience

MathWorks   Natick, MA
Software Engineer, Language of Technical Computing   January 2023 – Present

- Promoted within 6 months to the MATLAB Data Science Types team, whose mission is to develop tools that aid workflows involving richly-structured data.
- Enhancing a datatype conversion method for time stamped workflows, introducing a new property in existing abstract datatypes to facilitate metadata retrieval and type conversions, and optimizing components for `git` compliance are examples of current development projects.

Engineer, Engineering Development Group   July 2022 – January 2023

- Collaborated with scientists, engineers, and academics to understand their software needs for optimal productivity.
- Contributed to the internal knowledge base by publishing technical articles on effective solutions to issues raised by users.

Selected Software Projects

Parameter Estimation in Dynamical Systems: C++ library designed to perform gradient descent optimization on systems of ordinary differential equations for parameter estimation.

GuruDiff: Python library designed to implement forward and reverse mode automatic differentiation for gradient calculations.

SVDenoise: Python library designed to remove noise from images using an algorithm based on the singular value decomposition.

Computational Photography: C++ library designed for fundamental computational photography operations.

Selected Research and Teaching Experience

Inspirit AI   Palo Alto, CA
Instructor   June 2021 – Present

- Provide mentorship to students on tailored projects that implement fundamental machine learning algorithms and intricate deep learning models for diverse applications using frameworks such as Scikit-Learn, Keras, and TensorFlow.

Experimental Soft Condensed Matter Group at Harvard University   Cambridge, MA
Doctoral Researcher   September 2017 – July 2022

- Demonstrated proficiency in vertical integration by designing, fabricating, and executing a novel experiment to study colloidal suspension dynamics.
- Optimized the lab's gas tank management system, eliminating situations that previously led to gas supply outages.

Harvard John A. Paulson School of Engineering and Applied Sciences   Cambridge, MA
Teaching Fellow   January 2018 – May 2022

- Provided mentorship and academic support to over 100 students in the areas of mathematical modeling, software engineering, and high performance computing.

Skills

Deep Learning (Keras, PyTorch, TensorFlow, JAX), Supervised/Unsupervised Learning, Computer Vision, Reinforcement Learning, LLMs, Nonlinear Dynamics, Python (NumPy, SciPy, Pandas, Matplotlib), C++, Git/GitHub, OpenMP, MPI, Linux/Unix, Bash, LaTeX

Leadership and Awards

Derek Bok Certificate of Distinction in Teaching	May 2018, May 2022
Lab Safety Officer at Harvard University	November 2019 – July 2022
McKinsey & Company Diversity Connect Program	June 2020
Harvard-MIT Consulting Competition, *Semifinalist*	July 2018

Education

Harvard University   Cambridge, MA
Ph.D. in Applied Physics   November 2022
Thesis: *Spatio-temporal Measurements of Dynamic Suspensions* | Advisor: Professor David A. Weitz
M.S. in Applied Mathematics   November 2022

Texas Tech University   Lubbock, TX
B.S. in Mechanical Engineering, Minors in Mathematics and Physics   May 2016