Maxwell A. Fine

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Summary

Data Scientist & Astrophysicist with a strong foundation in Python, data science, and scientific computing. Experienced in developing high-performance data pipelines, real-time processing systems, and contributing to open-source scientific projects. Adept at working in collaborative environments

Technical Skills

Skilled in `Python`, `Bash`, `Linux`, with experience using packages such as `Astropy`, `Fetch`, `HEAsoft`, `Matplotlib`, `Numpy`, `Pandas`, `Presto`, `Pytorch`, `RM-TOOLS`, `Scikit-Learn`, `Scipy`, `TensorFlow`, and `Xspec`. Experienced in Bayesian analysis, time-series analysis, algorithm development, Convolutional Neural Networks (CNNs), Fourier analysis, signal processing, machine learning, deep learning, big data (Tb Scale), `Git`, `Docker`, and scientific computing. Experienced with `RaspberryPi` projects, and moderate knowledge in `C++`, `Julia`, `SQL`, `Kubernetes`, `GNU Radio`, cloud computing (AWS), and High-Performance Computing (HPC) environments.

Work Experience

Research Scientist
ASTRON (The Netherlands) *June 2024 – Aug 2024*

- Developed a real-time detection pipeline for Fast Radio Bursts (FRBs) for the Dwingeloo Radio Telescope, processing ∼1Gb/s data in `Python`.
- Utilized clustering techniques, and a Convolutional Neural Network for classification.
- Pipeline is open-source: Github Repository.
- Member of Camras Telescope collaboration

Research Scientist
University of Toronto & CHIME *May 2022 – Apr 2023*

- Conducted a multi-messenger search for X-ray and gamma-ray counterparts to CHIME/FRBs using Swift/BAT, an X-ray space-based telescope, and CHIME, a ground-based radio telescope.
- Developed a pipeline in `Python` using `HEAsoft` (written in `Bash`), and `XSPEC` for fluence modeling.
- Member of the CHIME international scientific collaboration

Research Scientist
University of Toronto & POSSUM *May 2020 – Aug 2021*

- Created a novel Rotation Measure synthesis algorithm for cases of extreme bandwidth depolarization.
- Contributed to the open-source `Python` package `RM-Tools` and published a first-author paper in the Monthly Notices of the Royal Astronomical Society.
- Error tested the `RM-Tools` analysis pipeline for POSSUM collaboration.
- Member of the POSSUM international scientific collaboration

Education

University of Amsterdam (UvA) Sept 2023 – June 2025

Master of Science in Astronomy & Astrophysics

University of Toronto (UofT) Sept 2018 – May 2023

Honours Bachelor of Science (HBSc) in Physics & Astrophysics

Awards & Recognitions

ASTRON Summer Research Fellowship, 2024 (€2,500 + Housing)
NSERC Undergraduate Student Research Award, 2021 ($6000)
Summer Undergraduate Research Fellowship 2020, 2021, 2022 (Total $30, 000)
Student Excellence and Leadership Award (UofT ($250)
John Pounder Prize in Astronomy (UofT), 2019 & 2021 (Total $600)