MATTHEW TRUSCOTT

PERSONAL INFORMATION

	email	matthew.a.truscott@gmail.com
	github	matthew-truscott
	gitlab	mat_av147
	bitbucket	Ragnamus
	linkedin	Matthew Truscott

WORK EXPERIENCE

2016-2022 **Researcher, University of North Texas — Denton**

MateriaLAB

- Built and modified cutting edge machine learning tools using Python, sklearn and TensorFlow for the prediction of chemical properties of proteins.
- Modified source code of existing Molecular Dynamics (Fortran) framework DL POLY to handle free energy analysis from repulsive potentials.
- Automated the preparation of input chemical structures and statistical analysis of time series data in Bash and Python.
- Scaled deployment on clusters running over 10000 core hours per day, producing gigabyte scale trajectory data.
- Maintained large Fortran codebase Environ, implemented new models to facilitate material discovery, cutting model training work down by 60%.
- Developed automation and database software (AiiDA plugin) in Python, reducing time spent running and sharing simulations. New researchers can expand on existing work without preparation times usually ranging from 20-200 hours.
- Managed small team of students to expand software capabilities. Adopted agile methodology, kanban boards, weekly one on one meetings with 4 other team members, mentoring, troubleshooting assistance.
- Managed server operations on a Linux machine for a group of 10 researchers, handling gigabytes of data with redundancy.
- Participated in hackathons dedicated to merging codebases, using Python to provide shared interfaces between highly parallelized C and Fortran codes. Developed qepy, a python wrapper to Quantum ESPRESSO, the worlds largest open source materials modeling suite.

Miscellaneous

- Ran calculations for laser efficiency in Mathematica. Analyzed circuit board designs for temperature control.
- Developed cooperative problem solving teaching material for Physics undergraduate students. Ran tutoring sessions.

2015 **Data Entry, Equiniti — Lancing, UK**

2014 **Summer Intern, Ricardo — Shoreham, UK**

Ricardo

- Improved a large existing codebase (MATLAB/C++) with minimal supervision.
- Optimized and benchmarked software (engine emission simulation) performance, and implemented a novel control strategy model in Simulink.

EDUCATION

2016-2022 **University of North Texas**

Ph.D, Physics

Quantum Optics · Electrochemistry · Computational · Catalysis
Research Assistant

2012-2014 **University of Cambridge, UK**

BA, Natural Sciences (Physical)

Physics · Computer Science · Chemistry · Mathematics · Astrophysics
CATAM projects: simulation work involving distribution of hydrogen ions around stars, and accretion discs around protostars.

PROJECTS

Game Development

- Battle Royale text based simulation in Rust.
- Small game projects in Unreal Engine 4, and tools for game development in Unreal Engine 5.
- Developed roguelikes Python and Rust (ECS).
- Wrote bots for private discord and slack servers in Python and Go. Scheduled jobs, sqlite backend, user management, image editing, API calls to Wikipedia, Reddit, and Google Suite.

Work related

- Ran non-linear optics simulations in Julia.
- Collaborated on a Python based condensed matter visualization tool. Led development of Blender plugin for professional quality rendering for materials science and chemistry
- Developed Fortran parser for wrapping modern fortran code with Python.

PUBLICATIONS

2019 Field-Aware Interfaces in Continuum Solvation

2019 Continuum models of the electrochemical diffuse layer in electronic-structure calculations

COMPUTER SKILLS

Basic SML, C, JAVASCRIPT, JULIA, R, MATHEMATICA, SQL, ASSEMBLY, C#, GO, SPARK

Professional Experience C++, MATLAB, PYTHON, FORTRAN, JAVA

Other Frequently Used LaTeX, LINUX, RUST, GIT

OTHER INFORMATION

Awards

2018 · Travel Award from Toulouse Graduate School, UNT

2018 · COS Graduate Student Travel Support Award, UNT

Presentations

2020 · Oral Presentation at the ACS Virtual Conference

2019 · Oral Presentation at the ACS Orlando Conference

2019 · Poster at EPFL Advanced Electronic Structure Methods in Condensed Matter Physics Summer School

2019 · Poster at MRS Phoenix Conference

2017 · Poster at APS Sacramento Conference

Interests Music Production · Game Development