

Varvara Efremova

I'm an experienced full stack software engineer with a scientific background, passionate about applying software engineering industry best practices to help advance scientific research.

I prioritise designing user-focused, modular, maintainable and well-documented applications, as well as establishing good coding practices to ensure project sustainability.

Projects

opendata.fit

2016 - Present | UNSW Sydney

Design, implementation and deployment of opendata.fit: a web-based data analysis and publication platform focused on improving reproducibility in research and supporting FAIR data principles.

- Architecture and development of modern microservice-based, asynchronous backend API
- JavaScript web application design and development
- DevOps infrastructure management including CI/CD
- Liaising with scientists to implement analysis algorithms across a variety of disciplines

Developed as part of the Australian Characterisation Commons at Scale project. Currently released as a closed beta at app.opendata.fit.

Python SciPy stack | Flask | Ember.js | TypeScript | MongoDB | WebSockets | RabbitMQ | Docker | Terraform

CI/CD pipeline for climate model builds

2022 - Present | ACCESS-NRI

Design and deployment of a CI/CD pipeline for automated build testing of Fortran-based climate models.

Docker | Github Actions | Spack

Education

2017 - 2018

Honours (Physics)

Australian National University

"Fabrication and characterisation of graphene/polycarbonate composite ultrafiltration membranes"

2010 - 2013

Bachelor of Science (Physics)

University of New South Wales

Skills

- Scientific programming
- API development
- Web application development
- Database & document store management
- Infrastructure-as-code deployments
- Containerisation
- CI/CD
- Unit/integration testing
- Bash scripting
- Linux server administration
- Graphic design

Bindfit – online binding constant fitter

2015 – 2016 | UNSW Sydney

Design and deployment of Bindfit, a web-based binding constant fitting and archival tool for NMR and UV spectroscopy data analysis. Ability to publish complete workflow and cite via single link. Available at app.supramolecular.org/bindfit.

Python SciPy stack | Ember.js | Django | PostgreSQL | AWS

AtomBlend

2014 | Australian Centre for Microscopy & Microanalysis, USyd

Development of a Python-based Blender addon for 3D visualisation, publication-quality 3D rendering, and interactive analysis of atom probe tomography data.

Python SciPy stack | Matlab | Blender

Solar car performance simulator

2014 | Sunswift, UNSW Sydney

Development of a Python software package for modelling and real-time simulation of solar car performance ahead of Sunswift's successful FIA land speed record attempt. Responsible for setting target speed of record attempt.

Python SciPy stack | Embedded systems

Automation of peak picking in spectroscopic analysis

2012 | Australian Astronomical Observatory

Development of a Python software package for automating previously manual spectroscopic data analysis processes.

Python

Spectroscopic data reduction automation

2011 | UNSW Sydney

Development of utility scripts for batch pre-processing and spectroscopic data reduction automation.

Python | Bash

Volunteering

2021 – Present

Canberra Makerspace

Managing the operations of a community makerspace, including administration, grant writing, volunteer coordination and tool maintenance.

2015 – 2017

Historical Aircraft Restoration Society

Assistance with general ground duties and minor aircraft maintenance jobs.

Hobbies

- Vehicle modification and maintenance
- Electric vehicle conversions
- Electronic music production
- Camping