Python & Web Software Engineer

Varvara Efremova

Hi, I'm Varvara! I'm a software engineer with extensive experience developing and working with Python-based codebases, as well as architecting complex web applications.

I prioritise designing user-focused, modular, maintainable and well-documented software systems, as well as establishing good engineering practices to ensure long term sustainability.

🛠️ Projects

opendata.studio

2016 - Present | UNSW Sydney

Working as a full stack Python & web developer to design, implement and deploy opendata.studio: a web-based data analysis and publication platform focused on improving reproducibility in research.

Liaising with researchers to implement analysis algorithms across a variety of disciplines.

- ➔ Scientific Python programming
- ➔ Python-based REST backend architecture and implementation (Django, Flask)
- ➔ Asynchronous task-based worker API architecture and implementation (WebSockets, RabbitMQ, Celery)
- ➔ SolidJS/TypeScript frontend architecture and implementation
- ➔ Infrastructure management and CI/CD via infrastructure-as-code with Terraform and AWS

Documentation available at https://docs.opendata.studio/

Web strategy for ACCESS-NRI

2023 - 2024 | ACCESS-NRI

- ➔ Consulted ACCESS-NRI and its community stakeholders to identify pain points and requirements for current and future web services
- ➔ Delivered a series of presentations outlining identified needs and recommended options for implementation of web services
- ➔ Worked with the Model Release team to produce an implementation plan of the preferred option of an online "Experiment Portal"

📌 **Canberra, ACT**

🎓 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

- Python application architecture and development
- Full stack web application architecture and development
- REST API architecture and development
- Technical communication
- Database design and management
- Scientific programming
- Infrastructure-as-code deployments
- Containerisation
- CI/CD
- Unit/integration testing
- Bash scripting
- Linux server administration
- Graphic design

CI/CD pipeline for climate model builds

2022 - 2023 | ACCESS-NRI

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

Development of a NixOS-based Github Actions runner configuration for automated deployment.

Bindfit - online binding constant fitter

2015 - 2016 | UNSW Sydney

Designed and deployed Bindfit, a web-based binding constant fitting and archival tool for NMR and UV spectroscopy data analysis. Ability to publish an analysis workflow and cite via a link. Cited by 500+ papers as of 2024.

Python (Django) REST backend, PostgreSQL database, Ember.js frontend.

Available at https://app.supramolcular.org/bindfit
Source at https://github.com/echus/supramolecular-apps

AtomBlend

2014 | Australian Centre for Microscopy & Microanalysis, USyd

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

Available at https://github.com/echus/atomblend

Solar racing strategy team lead

2015 - 2016 | UNSW Sydney

Developed a Python software package to simulate the performance of Sunswift's solar car eVe in preparation for a successful FIA land speed record attempt. Responsible for setting target speed of record attempt based on simulation results.

Working with and debugging embedded systems producing telemetry data for real-time simulation.

Python package for astronomical spectroscopy analysis

2012 - 2013 | Australian Astronomical Observatory (AAO)

Developed Python software package for automating previously manual spectroscopic data analysis processes.

Performed chemical abundance analysis of binary star clusters. Work published in MNRAS.

✋ Volunteering

2021 - Present

Canberra Makerspace

(Make Hack Void)

President

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

2015 - 2017

Historical Aircraft Restoration Society (HARS)

Volunteer

Assisted with general ground duties and minor aircraft maintenance jobs.