SADIE L. BARTHOLOMEW

Computational scientist | Open-source contributor

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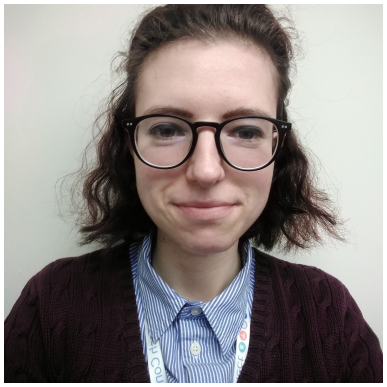

PROFESSIONAL EXPERIENCE IN COMPUTING

Computational Scientist [Jan. 2020 - present]

National Centre for Atmospheric Science, Computational Modelling Services group, based at University of Reading Dept. of Meteorology

- **Developing, optimising and providing user services for `cf-python`, an earth science data analysis library, and supporting packages**, plus wider work promoting the *CF Conventions* standard, for example as a member of the official 'Information Management and Support' team.
- **Engineering infrastructure and supporting workflows for *ES-DOC*** (the Earth System Documentation project), with responsibility for the *CMIP6* simulation machine and performance end-to-end workflow.
- Further ad-hoc work in **HPC and climate modelling support**.

Scientific Software Engineer [Oct. 2017 - Nov. 2019]

Met Office, Modelling Infrastructure Support Systems team

Developing, maintaining and supporting users of the infrastructure systems `cylc`, `rose` and `fcm` used to configure and run scientific software for both operational forecasting and research. For example:

- implemented suite host selection and asymmetric cryptography in, and wrote a syntax lexer and software-checking utility for, `cylc`;
- converted the entire `cylc` documentation from raw LaTeX to Sphinx;
- overhauled web applications, including porting a Python 2 `rose` utility utilising the `cherrypy` web framework to Python 3 and `tornado`;
- registered numerous bug reports, bug fixes, user requests, and ideas;
- co-delivered internal training courses and an internal update seminar.

FURTHER OPEN-SOURCE CONTRIBUTIONS...

...to those made as part of core work for employed roles. Only notable items are listed; for a full record see the GitHub user *sadielbartholomew*.

Reviewer for Journal of Open Source Software [June 2020+]

- **Selected as reviewer for a number of submissions to the journal JOSS**, providing feedback to see these through to publication.

Optimisation of the epidemiology model `JUNE` [Aug. - Oct. 2020]

- With a small team from NCAS, **optimised the performance of a new epidemiology simulation, `JUNE`, as part of research into COVID-19**.
- Collectively **produced an $\mathcal{O}(100)$ latency speedup** to the pre-alpha stage, receiving formal acknowledgement in the official release paper.

Annual completion of *Hacktoberfest* challenge [Oct. 2018+]

- **Winner of prizes for three consecutive years** for completing the DigitalOcean open-source initiative *Hacktoberfest* each October.

Open personal project: creativity with `matplotlib` [2016+]

TECHNICAL SKILLS

Key: ◐ ability self-assessment | ★ preferred

PROGRAMMING LANGUAGES:

- Professional and/or academic use of:
  - Python ●●●●◐ (see also below →)
  - Unix shell (Bash ★) ●●●●◐
  - C++ ●●●○○
  - Emacs Lisp ●●●○○
  - JavaScript ●●○○○
- Recreational use of, as well as the above:
  - Common Lisp ●●○○○
  - Haskell ●●○○○

→ notable Python ecosystem competence:

NumPy | SciPy | Dask | `matplotlib` | Jupyter | Sphinx | `mpi4py` | Numba | Airflow | Tornado | `netcdf4-python`

MARKUP LANGUAGES:

- Intermediate to advanced ability with:
  - Markdown | reStructuredText | HTML | YAML | LaTeX | INI
- Basic proficiency with:
  - XML | TOML | Emacs Org-mode

INFRASTRUCTURE AND SYSTEMS:

- OS: Linux ★ | Windows
- Version control: git ★ | SVN
- Development environment: emacs ★
- Scheduling: slurm | PBS | cron | at
- Host: GitHub ★ | GitLab | Bitbucket
- Web technologies: CSS | Vue.js
- Other notable: conda | MPI | SQL

- **Evolving an independent project,** `creative-matplotlib`, showcasing expressive application of the Python visualisation library `matplotlib`.

PUBLICATIONS IN REFEREED JOURNALS

- Hassell, D. and Bartholomew, S. L., 2020, *'`cfdm`: A Python reference implementation of the CF data model'*, published in **Journal of Open Source Software** [5(54), p.2717] (**DOI: 10.21105/joss.02717**)
- H. Oliver *et al.*, 2019, *'Workflow Automation for Cycling Systems'*, published in **Computing in Science & Engineering** [21(4), pp.7-21] (**DOI: 10.1109/MCSE.2019.2906593**)

SELECTED DELIVERED PRESENTATIONS

- Independently devised and presented a software demonstration, *'Configuring Sphinx from scratch'*, as part of the **Series of Online Research Software Events (SORSE)** in November 2020.
- Co-presented a talk, *'Pursuing and supporting reproducible workflows for all with Cylc'*, at the **Fourth Conference of Research Software Engineering** ("RSEConUK 2019") in September 2019.

SIGNIFICANT TEACHING EXPERIENCE

- Led the second half of the **Input/Output and Middleware (Storage II) session** of the *ESiWACE Summer School on Effective HPC for Climate and Weather*, held August 2020 and due again for 2021.
- Co-delivery of the **National Centre for Atmospheric Science's regularly-held day-long course on Python for atmospheric science, *Data Analysis Tools***, including leading the section about regridding.

OTHER NOTABLE WORK EXPERIENCE

Student Research Assistant [Dec. 2015 - March 2017]
Coltraco Ultrasonics Ltd

- **Conducting scientific and technical research** relating to ultrasonic measurement on a remote, part-time basis, assimilating into reports.

Science and Technology Editor [2014 - 2015; 2013 - 2014]
Palatinate Newspaper; The Bubble Magazine

- **Sourcing and writing articles to deadlines** for two separate student publications, receiving the *Hunter Davies Prize for Journalism* in 2014.

EDUCATION

MPhys (Hons) Integrated Masters in Physics [Oct. 2012 - June 2017]
Durham University

- **Final-year computational project** entitled *'Searches for boosted top quarks'*, evaluating and refining top-tagging algorithms implemented in C++, as applied to simulated LHC proton-proton scattering events.
- **Undergraduate physics syllabus plus elective masters-level modules** on Advanced Quantum Theory, Particle Theory and Cosmology.

Secondary Education [2007 - 2012]
Ponteland Community High School

- **A levels**: Physics (A*), Chemistry (A*), Mathematics (A*), Further Mathematics (A), Critical Thinking (A)
- **Other**: Extended Project Qualification (A*), CREST Gold Award
- **GCSE**: 11 A* qualifications including French and self-taught History

SOFT SKILLS

Five soft skills to highlight:

Collaboration spanning time zones | End-user empathy | Creativity | Curiosity | Continuous learning

ENGINEERING EXPERIENCE

Practiced in software engineering processes:

Software development life cycle stages | Use of Tier-1, -2 and -3 HPC facilities | Design patterns | User support | Peer review of code and written proposals | Documentation writing and infrastructure | Continuous integration | DevOps

PROFESSIONAL INTERESTS

High-performance computing | Big data | Infrastructure relating to earth simulation | Metadata | Workflows | Open source | Data models | Performant Python

OTHER INTERESTS

Art | Reading | Guitar | Live music | Chess | Walking | Cycling | Cookery

REFERENCES

Available on request.

RÉSUMÉ METADATA

- Last update: February 15, 2021
- Adapted from the LaTeX template 'AltaCV'