Dr. Samantha Mitchell Finnigan

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Profile

I am a Senior Research Software Engineer (SRSE) with expertise in full-stack web development, application design and architecture, cloud technologies, and embedded computing. I hold a PhD in Human-Computer Interaction, and have a decade of experience producing software and hardware for use in research. I am passionate about high quality research software and best-practice, am active in the wider RSE community, and have provided technical expertise to the scoping and preparation of multiple successful software funding bids.

Professional Experience

Senior Research Software Engineer – Advanced Research Computing, *Durham University* (Sept. 2022-present)
Designed and delivered research software projects including: flood modelling in Java, Indonesia; anti-artefact-trafficking using computer vision; and a polling platform for ascertaining scientific consensus. Represented ARC in strategic university endeavours including development of the CIS Advanced Web Hosting environment on Microsoft Azure, and nationally at industry and professional body meetings. Responsible for developing departmental strategy including a new requirements engineering process; developing project proposals and funding bids; supporting RSE colleagues in their work; and delivering teaching and training.

Research Software Engineer – RSE Team, *Newcastle University* (August 2021–August 2022)
Investigated trust in financial machine learning and AI; and designed blockchain solutions for recycling. Worked collaboratively to define & implement software, and helped deliver Software Carpentries workshops.

Research Fellow – TGRAINS project, *Northumbria University* (March 2019–August 2020)
Full-stack web development of the TGRAINS crop model visualisation, and qualitative research design, facilitation, and data analysis. Collaborated with other researchers to integrate system components.

Research Consultancy – Consulting for *Axivity Ltd* and *Northumbria University* (January–March 2018)
Consultancy on the deployment of environmental sensors in social housing, and analysis of sensor data.

Research Assistant – part-time, *Newcastle University* (2013–14 & June–December 2016)

Industrial Trainee (Software Development) – Hursley Laboratory, *IBM UK Ltd* (2011–12)
Development of automated software verification test (SVT) infrastructure for the IBM Java Virtual Machine.

Qualifications

PhD Computing Science (Human-Computer Interaction)   Grad. July 2022
Human-Centred Smart Buildings: Reframing Smartness   *Open Lab, Newcastle University*
Through the Lens of Human-Building Interaction

Doctoral Thesis: Smart buildings backed by data and algorithms promise reduced energy use and increased value for businesses and occupants. My dissertation argued through three building technology case-studies that smart buildings and digital facilities management must centre the human over processes of automation.

BSc Computing Science (Hons) with Industrial Placement   1st Class Hons., June 2013
Undergraduate dissertation: *"Motivating Behaviour Change in Energy Consumption"*   *Newcastle University*

Technical Skills

Programming languages	Python; JavaScript (ES6); TypeScript; Java; C; C++; Bash; PHP; Perl; HTML5/CSS3
Libraries (selected)	Vue.js; Node.js; jQuery; React; Django; Chart.js; Flask; Pandas; Matplotlib; NumPy

Web technologies	Nginx; Apache; Redis; MySQL; MongoDB; RabbitMQ; MQTT; WordPress
Cloud technologies	Docker; Microsoft Azure; Amazon AWS; Google Cloud; DigitalOcean; Træfik
Embedded platforms	ESP8266; Arduino; Teensy; Raspberry Pi; microPython; SPI/I²C peripherals
Development tools	Git; Subversion; CI/CD using Bitbucket & GitHub; vim; Jupyter; GNU Make; CMake
Operating Systems	GNU Linux incl. Debian/Ubuntu (& on Raspberry Pi); Mac OSX; Microsoft Windows
Hardware Prototyping	3D printing (inc. Prusaslicer); Autodesk Fusion360; hobbyist PCB design/electronics

Professional Skills

- Experience undertaking complex software development projects; quick to learn new technologies
- Strong problem-solving and analytical skills, significant programming experience and knowledge
- Rigorous development practices including CI/CD and automated testing (test-driven development)
- Professional and taught experience of software development methodologies, e.g. agile / pair programming
- Ability to work with researchers from other disciplines to scope projects and define software requirements
- Experience working as part of a team of software developers, pair programming, and co-problem solving
- Planning and organising software projects, managing timescales, and delivering incremental prototypes
- Experience with public speaking; confident in delivering presentations, talks and lectures
- Teaching and demonstrating experience, delivering content and assisting students with coding tasks
- Have published high quality academic work at top-tier venues; produced thorough software documentation

Selected Peer-Reviewed Publications

[1] **Mitchell Finnigan, Samantha**. and Clear, Adrian K. 2020. "'No powers, man!': A Student Perspective on Designing University Smart Building Interactions", *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI'20. ACM, Honolulu, HI, USA. https://doi.org/10.1145/3313831.3376174

[2] **Mitchell Finnigan, Samantha**, Clear, Adrian K., Olivier, Patrick. 2018. SpaceBot: Towards Participatory Evaluation of Smart Buildings. *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems,* CHI'18 EA*.* LBW551. ACM. https://doi.org/10.1145/3170427.3188491

[3] Clear, Adrian K., **Mitchell Finnigan, Samantha**, Olivier, Patrick, Comber, Rob. 2018. ThermoKiosk: Investigating Roles for Digital Surveys of Thermal Experience in Workplace Comfort Management. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, CHI'18. 382. ACM. https://doi.org/10.1145/3173574.3173956

[4] **Mitchell Finnigan, Sam**, Clear, Adrian K., Farr-Wharton, Geremy, Ladha, Karim, Comber, Rob. 2017*.* Augmenting Audits: Exploring the Role of Sensor Toolkits in Sustainable Buildings Management*. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies,* Ubicomp'17. 1, 2, 10. ACM. https://doi.org/10.1145/3090075

Professional and Academic Citizenship

Conference Presentations: ACM CHI 2020 (*April 2020, online*) [above 1]; ACM CHI 2018 (*April 2018, Montreal, Canada*) [2]; ACM CSCW 2017 (*Feb. 2017, Portland, USA*) [3]; ACM UbiComp 2017 (*Sep. 2017, Maui, USA*) [4];

Peer reviewing: 18 papers total, 2015-2021.

Volunteering: CarpentriesOffline HPC cluster working group; Software Carpentries workshop facilitator (2022).

Equality, Diversity & Inclusion: RSE Society EDIA working group (2023); Newcastle University Rainbow@NCL LGBT+ steering group (2017-19, 2021-22); Gender, Trans and Non-Binary Working Group (2018-19); School of Computing ED&I committee (2017-18). Co-founder of https://fempower.tech/ (2016-present).

Teaching: ARC Course facilitator for Python, Git (2023); Software Carpentries instructor (2022-present);

Hackathons: Create4Dementia – 1st prize (May 2015); Digital Catapult Environmental Data Exchange EDXHack– Prize winner (Feb 2015); North Tyneside Railway Museum – Hack Facilitator (April 2016)

Open Source Software: author and contributor to >20 open source software projects (https://github.com/sjmf/)