

An Introduction to Research IT

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What is Research IT?

- Part of the IT Services Organization
 - Separate from
 - Business Systems
 - Teaching and Learning

- Researcher and research focussed

- Broadly, two themes:

- Research Infrastructure
- Research Software

Training

- Links to external organizations:
 - Software Sustainability Institute
 - Regional and national facilities (N8 HPC, ARCHER, etc)

Research Infrastructure

Overview

- The Goal
 - Provide integrated, end-to-end IT infrastructure for research
 - Increased *capacity*, greater *security* over local systems
- The infrastructure
 - Compute, storage, virtual machines, ...
 - ...all joined together by dedicated, fast, secure networking
- The people
 - All of the above professionally managed on behalf of researchers

Available as the *Computationally Intensive Research Ecosystem*

What can it do for Researchers?

- Higher Throughput and Parallel Compute
 - Run hundreds of computations (jobs) at once.
 - A job can use many CPUs simultaneously (finishing the job sooner).
- More Memory
 - Run bigger jobs - process larger models/datasets
- Storage
 - Lots of resilient, backed-up storage - many, many TB
 - No more **USB-disks!**
- Virtual Machines (VMs)
 - Ad-hoc servers (but in a controlled environment) - web servers, DBs, development
 - No more **under-desk servers!**

Research Infrastructure Further Information

- Computational Shared Facility (and friends)
 - <http://ri.itservices.manchester.ac.uk/csf3>
- Condor (High Throughput)
 - <http://ri.itservices.manchester.ac.uk/condor>
- Research Data Storage
 - <http://ri.itservices.manchester.ac.uk/rds>
- Research Virtual Machines
 - <http://ri.itservices.manchester.ac.uk/rvms>
- General enquires
 - its-ri-team@manchester.ac.uk

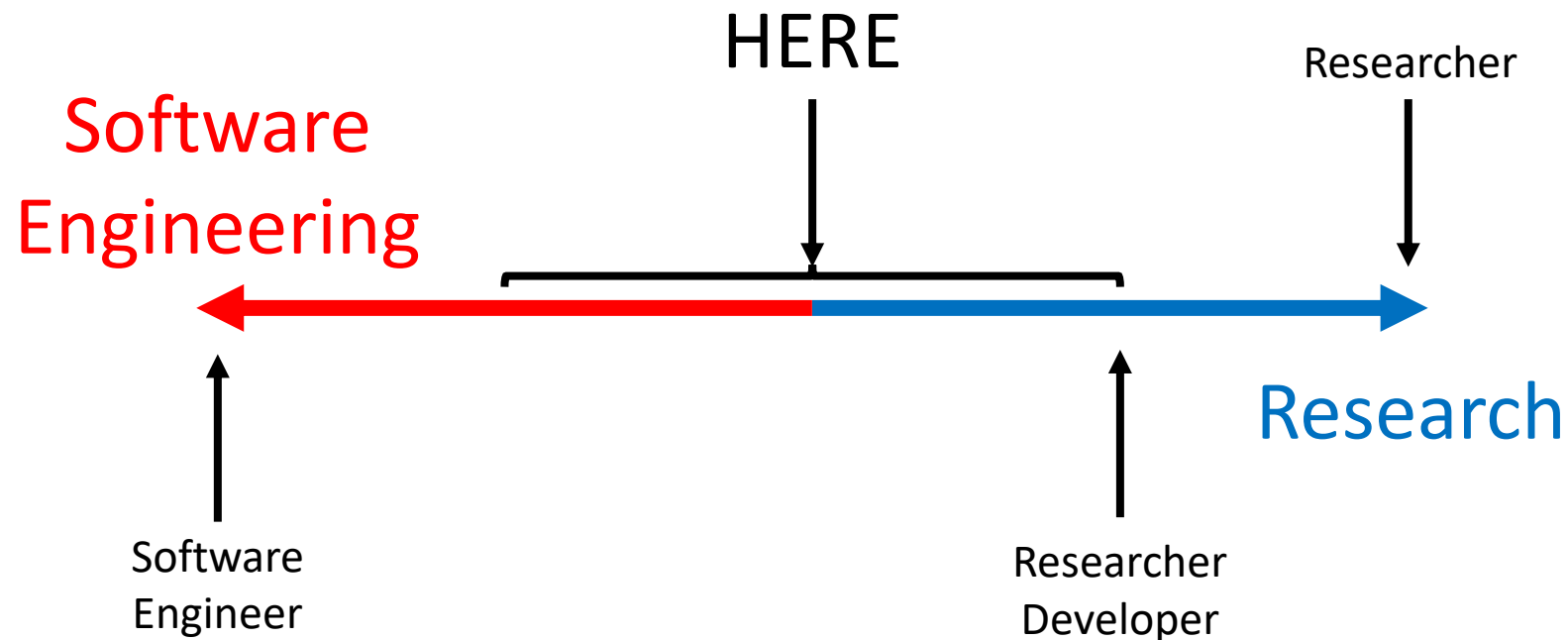
Research Software Engineering

Research Software Engineering mission statement

“Enhance the University’s capacity to produce high quality research software by collaborating with researchers to create correct, efficient, readable, reliable and sustainable code.”



What is a Research Software Engineer?



The Craftsperson and the Scholar



Image courtesy of Beinecke Library and bcom

RSE Team: one slide introduction

- “Pool” of professional software engineers
 - Programmers, engineers, data scientists
- Advice on, and specification of, research software requirements
 - Help with the software/technical aspects of grants and bid writing
 - Can also help with recruiting software engineers into research groups
- Short-term support
 - Applications support (hours/days)
 - Training
- Long and medium-term software engineering support
 - ~weeks to years of effort
 - Varying levels of FTE ($\geq 20\%$)
 - Targeted deployment at certain times within a project
 - Can be embedded into research groups
- Can be engaged pre- or post-award
 - Day rate (£250) or FEC (G7.1)



FREE!

RSE engagement

- Much like anyone else involved in a research project
- We'll discuss your proposal and potential requirements
 1. Identify how we can help
 2. Consider resources you might need to cost in:
 - Access to RSE time
 - Access to software packages and/or infrastructure
 3. We'll work out our costs
 4. Iterate!
- Get in touch:
 - FSE: ian.cottam@manchester.ac.uk
 - FBMH: andrew.jerrison@manchester.ac.uk
 - FHUMS: theresa.teng@manchester.ac.uk
 - Mobile: adrian.harwood@manchester.ac.uk
 - General: its-research@manchester.ac.uk

- Introduction to Linux/UNIX shell
- Introduction to Python
- Programming in Python
- Introduction to Data Visualization
- Introduction to HPC and using the CSF
- Automation and Make
- LaTeX course (inc. UoM Thesis template)
- Data Analysis with R
- Interactive data viz with R and Shiny
- Version control with Git and GitHub
- Introduction to MATLAB
- Introduction to Mathematica

• More information + online courses here:

<http://bit.ly/2w6TfC0>

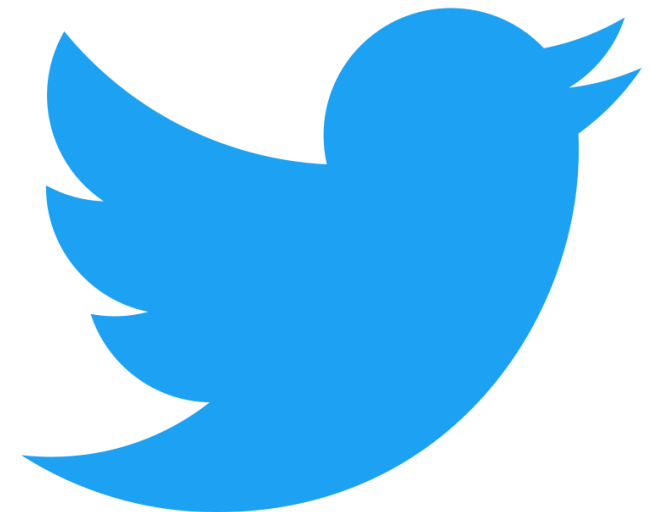


Training Courses



How to contact Research IT

- Website:
 - <http://www.itservices.manchester.ac.uk/research/>
- Support Centre:
 - <https://support.manchester.ac.uk>
- Twitter:
 - [@UoM_eResearch](https://twitter.com/UoM_eResearch)
- Blog:
 - <https://researchitnews.org/>
 - Sign up to our newsletter here

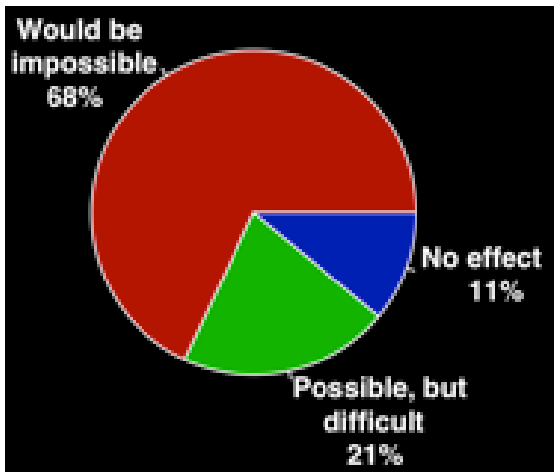
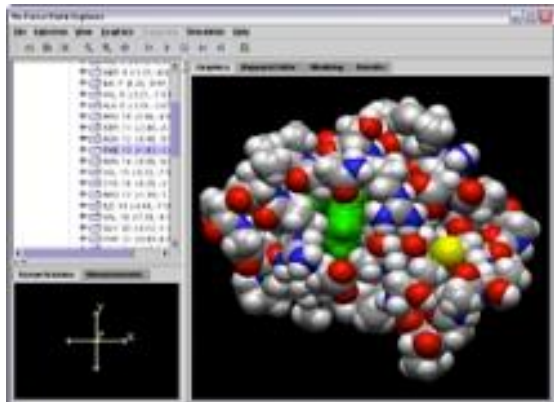


The Software Sustainability Institute

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Overview



Software

70+ project
consultancies

200+
evaluations

4 surgeries

Training

100+ Carpentry
workshops

2500+ learners

80+ guides

Outreach

170+ external
contributors

20k unique
visitors/month

6k+ followers

Policy

650+ RSEs
engaged

2k signatures

13 issues
highlighted

Community

129 Fellows

25+ workshops
organised



Support and Guidance

- Professional evaluation service
- Online evaluation
- Guides and support
- Future priorities



Online Evaluation

- Fill in form (15 mins)
- Receive tailored advice
 - Building
 - Installing
 - Testing
 - Documentation
 - Support
 - Portability
 - Contributor policy
 - Copyright
 - Licences

Q1 - What your software does

Question 1.1: Does your website and documentation provide a clear, high-level overview of your software? *

- ☐ Yes
☐ No

Question 1.2: Does your website and documentation clearly describe the type of user who should use your software? *

- ☐ Yes
☐ No

Question 1.3: Do you publish case studies to show how your software has been used by yourself and others? *

- ☐ Yes
☐ No

Q2 - Your project's and software's identity

Question 2.1: Is the name of your project/software unique? *

- ☐ Yes
☐ No

Q3 - Availability of your software

Question 3.1: Is your software available as a package that can be deployed without building it? *

- ☐ Yes
☐ No

Question 3.2: Is your software available for free? *

- ☐ Yes
☐ No

Question 3.3: Is your source code publicly available to download, either as a downloadable bundle or via access to a source code repository? *

- ☐ Yes
☐ No

Question 3.4: Is your software hosted in an established, third-party repository like GitHub (<https://github.com>), BitBucket (<https://bitbucket.org>), LaunchPad (<https://launchpad.net>) or SourceForge (<https://sourceforge.net>)? *

- ☐ Yes
☐ No

Guides and Support

- Detailed evaluation guides online:
 - Tutorial-based
 - Criteria-based
- Software Management Plans:
 - What software will you write?
 - What infrastructure will you need?
 - Who will use it?
 - What will you release..?



Discussion item

- What are the top three things that Research IT could do to support reproducibility?