NITheCS

National Institute for
Theoretical and Computational Sciences

NITheCS MINI-SCHOOL:
Research Software Engineering as an exciting career and a critical component of the research ecosystem

Wednesday 4, 11, 18 & 25 October 2023 | 14h00 – 15h00 SAST
Venue: online

ABSTRACT: This series of talks celebrates International Research Software Engineering (RSE) Day, declared to be on the second Thursday of October by the International RSE Society. The talks aim to give the audience a comprehensive understanding of the RSE role and the value RSEs can offer to the research environment. It should be of interest to new graduates and early-career researchers who may wish to consider RSE as a future career direction. It should also interest policy makers within research institutions and funding agencies who may wish to develop an understanding of the importance of RSE in the research context, and how and why RSEs should be developed and supported.

LECTURE 1 (4 Oct)

'Becoming a Research Software Engineer' - Jeremy Cohen (Imperial College London)

Research Software Engineers (RSEs) are technical experts who work closely with researchers to build, improve or provide guidance on the software used to support or undertake research. They advocate for the use of software development best practices and provide training on these approaches and apply them in their own work. Despite the role RSEs play in supporting research, many members of the RSE community are self-taught. This talk will look at some background to the development of the RSE movement and the array of activities RSE roles can encompass. It will also look at the types of skills that RSEs typically have and highlight some paths and materials for RSE skills development. The talk will highlight the many benefits of being an RSE that help to make the role a rewarding choice of career path.

LECTURE 2 (11 Oct)

'Research Software Engineering groups as a way to provide RSE support to researchers' - Dr Kim Martin (SU)

RSEs support researchers in generating efficient, correct and reproducible research, and in promoting the development of sustainable (and re-usable) software for research. This talk will introduce the concept of RSE Groups as an emergent outcome of the decade-long history of the RSE movement that originated in the UK; highlighting how such teams of RSEs can support researchers in their host institutions. It will also discuss the findings of the 'RSE Roadtrip' – a study of examples of RSE Groups at multiple UK universities. The Roadtrip aimed to understand how RSE Group diversity (in terms of organisational context and other structural and functional features) affects member RSEs, and suggest best practices for the formation and sustainability of RSE Groups.

LECTURE 3 (18 Oct)

'The value of Research Software Engineers for reproducible and applied research' - Dr Martin O'Reilly (Alan Turing Institute)

This talk will discuss the foundations of reproducible research at the Alan Turing Institute, and the key role of Research Software Engineers (RSEs) in turning research into practice at the UK's National Institute for data science and artificial intelligence. It will showcase how the Alan Turing Institute develops and maintains the RSE capacity it needs, and the various forms of support that RSEs are able to provide to researchers.

LECTURE 4 (25 Oct)

'How and why research institutes should support Research Software Engineers' - Michelle Barker (Research Software Alliance)

Research data management policies have been implemented to promote transparency, integrity, preservation, and overall value maximisation of research data in scientific research. An increasing number of initiatives are focusing on implementation of research software within the context of FAIR and open science. Efforts to align policies from funders, journals, and governments are also in progress. However, there are significant questions about how research performing organisations can develop and implement policies to help sustainability of software outputs and underpin research quality. The Research Software Alliance (ReSA) was founded in 2019 with the vision that research software and those who develop and maintain it be recognised and valued as fundamental and vital to research worldwide. This talk will discuss how Research Software Engineers (RSEs) may be key to driving improvements in research software development and preservation, and how research institutes may be able to drive improvements through supporting RSEs.

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BIOGRAPHIES

Jeremy Cohen

Jeremy Cohen is an Advanced Research Fellow in the Department of Computing and Director of Research Software Engineering (RSE) Strategy at Imperial College London. He has recently completed a 5-year EPSRC RSE Fellowship, working on a range of aspects including investigating RSE models and processes and undertaking various community development and training activities.

Jeremy has a Computer Science background and has been involved in a number of multi-disciplinary collaborations, working with researchers from different fields to apply research software and computer science expertise to research problems. He has been actively involved in the building of communities that help bring together researchers and software developers from a wide range of research domains.

Jeremy leads the Imperial Research Software Community which he founded in 2015, and also runs RSLondon, the regional research software community for London and the South East of England which he started in 2018.

He is currently a Co-I on the UNIVERSE-HPC project ('Understanding and Nurturing an Integrated Vision for Education in RSE and HPC'), which aims to define training pathways - spanning from undergraduate to continuing professional development level - to support researchers and Research Software Engineers (RSEs) wanting to develop specialist expertise in the area of High Performance Computing (HPC).

Kim Martin

Kim Martin has a PhD in Biomedical Science from Edinburgh University and is a Hans Merensky Postdoctoral Fellow at Stellenbosch University, where she is engaged in establishing RSE@SUN. This is an initiative inspired by the Research Software Engineering Groups that were established at leading universities in the UK and elsewhere over the last decade.

Since discovering the Research Software Engineer (RSE) role during a conference in mid-2021, Kim has been deeply engaged with RSE advocacy in South Africa. For this, she was awarded one of the first International Software Sustainability Institute (SSI) Fellowships in the 10-year history of the SSI's Fellowship programme.

She has been a speaker at the 2022 and 2023 RSE Conferences in the UK, and was awarded the RSE Society's 'Rising Star' Award in 2022 in part for her efforts to raise awareness among South African researchers about the potential value of RSE support. In mid-2023, Kim was funded by the SSI to conduct a tour of 14 UK research institutions to interview RSEs as part of an ambitious survey of how successful RSE Groups function in different contexts. The aim is to translate her findings into a proposal for the next stages of the RSE@SUN initiative at Stellenbosch University.

Martin O'Reilly

Martin O'Reilly is Director of Research Engineering at the Alan Turing Institute. He leads a group of Research Software Engineers, Research Data Scientists and Research Computing Engineers, who collaborate across the Institute's research portfolio to help researchers bridge the gap between research and practice. This is done through the development and deployment of re-usable software, reproducible analysis pipelines, and flexible research computing resources.

His focus is on using good software engineering practices to increase the impact of research software and data science analyses by making these reusable, reliable and robust. He also has a strong interest in reproducible research, and is working to improve the tools and working practices available at the Turing to make it easier for researchers to work reproducibly.

Martin has a PhD in computational neuroscience from UCL, and an MSc in artificial intelligence from Edinburgh. His experience in developing software, managing software projects and managing technical teams spans both the research and business sectors, having spent several years doing this in the commercial sector between stints in academia.

Michelle Barker

Michelle Barker, co-founder and Director of the Research Software Alliance (ReSA), has extensive expertise in open science, research software, skills and infrastructure.

As a sociologist, Michelle is passionate about building collaborative partnerships to achieve system change. She serves on advisory boards for FAIR Impact, Research Sofware Engineers Asia Association, SBGrid, and the Research Data Alliance Organisational Advisory Board.

As a consultant in the field of open science, her roles have included chairing the OECD Expert Group on digital skills for the research sector and co-editing the European Open Science Cloud report, Digital Skills for FAIR and Open Science. Michelle is a former Director of the Australian Research Data Commons, where she led the strategic planning for the Australian government's $180 million, five-year investment in ARDC, the national research software infrastructure investment programme, and developed a national strategy to enhance digital workforce capacity in the research sector.