



## ROLE PROFILE

<b>Job Title:</b>	Research Software Engineer
<b>School/Department:</b>	Digital Research Service (IS)
<b>Job Family and Level:</b>	APM4
<b>Contract Status:</b>	Fixed term until 31 January 2024
<b>Hours of Work:</b>	Full-time (36.25 hours per week)
<b>Location:</b>	University Park Campus
<b>Reporting to:</b>	Team Leader of Digital Research Service

### Purpose of the New Role:

This Research Software Engineer (RSE) role is to be appointed on a permanent contract within the Digital Research team at Nottingham, with a substantial portion of the time for the first 5 years dedicated to a £2M Wellcome-funded project entitled “Developing cardiac electrophysiology models for drug safety studies” led by Dr Gary Mirams in the Centre for Mathematical Medicine & Biology in the School of Mathematical Sciences. The role holder will work with the PI, postdoctoral researchers and PhD students to develop and use scientific software for research purposes, and will collaborate with industrial users of the simulation software as well as other research groups.

The main software packages that we are developing include:

- **Chaste:** a C++ library for computational physiology. Unusual in that it is over 10 years old and has always been developed with industrial practices in terms of object-oriented code, continuous integration, coverage testing, memory testing, etc. HPC ready. See <http://www.cs.ox.ac.uk/chaste/> for more info. Dr Mirams’ team works primarily on the Cardiac component of Chaste.
- **AP-predict:** a bolt-on C++ project to Chaste which utilises its CellML handling and cardiac capabilities to run simulations of drug action on the heart.
- **AP-portal:** a web-based interface to AP-predict which allows non-expert users to enter input data, runs simulations via web-services, and stores results in a database for later retrieval. We will continue to develop both codes and provide new features for users in safety pharmacology areas. We are looking to move it to cloud-based computation.

This RSE role will also collaborate with the Auckland Bioengineering Institute to use the [CellML markup language](#) to represent our mathematical models. As part of this project we will contribute to the development of the [CellML API](#) to be used to produce C++ code for the models, and interface with the [Physiome Model Repository](#) (PMR), and data repositories to ensure our research outputs (models, software and experimental data) are accessible and appropriately stored and indexed and linked.

	<b>Main Responsibilities</b>	<b>% time per year</b>
1.	<p><b>Undertake research software engineering to support the Wellcome-funded project entitled “Developing cardiac electrophysiology models for drug safety studies”</b></p> <ul style="list-style-type: none"> <li>• Design, construct, test and document software to support the needs of the researchers and work with them to use it for research to be published in scientific journals.</li> <li>• Take responsibility for the definition, documentation and satisfactory completion of collaborative digital research projects defining requirements, timescales priorities, milestones and managing risks to the success of the project.</li> <li>• Support researchers in understanding the benefits of following data handling best practices</li> </ul>	75%
2.	<p><b>Promote the service</b></p> <ul style="list-style-type: none"> <li>• Actively represent Digital Research Service with a remit to offer specialist expertise and guidance</li> <li>• Promote awareness, access and use across the institution</li> <li>• Provide researchers with access to expertise and advice that has a strong impact on improving research quality</li> </ul>	10%
3.	<p><b>Deliver Output</b></p> <ul style="list-style-type: none"> <li>• Support researchers by contributing to research papers to be published in academic literature</li> </ul>	5%
4.	<p><b>Personal Development</b></p> <ul style="list-style-type: none"> <li>• Develop own skills and professional capability in line with the needs of the service.</li> <li>• Maintain an awareness of technical developments, tools and ideas in research computing, including attending seminars, technical briefings, conferences and technical groups</li> </ul>	5%
5.	<ul style="list-style-type: none"> <li>• Any other duties appropriate to the grade and role of the person appointed.</li> </ul>	5%

## Knowledge, Skills, Qualifications & Experience

	Essential	Desirable
<b>Qualifications/ Education</b>	<ul style="list-style-type: none"> <li>Postgraduate research degree involving writing software for computational modelling</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>Equivalent professional experience in a related field, e.g. providing analytics or software development in support of research and development in an academic or industrial setting.</li> </ul>	
<b>Skills/Training</b>	<ul style="list-style-type: none"> <li>The ability to learn and employ different software development processes and manage applications</li> </ul> <p>Skills could include:</p> <ul style="list-style-type: none"> <li>Collaborative software writing as part of a team</li> <li>Developing applications to industry standards</li> <li>Experience of porting codes to different architectures</li> <li>Experience of using cloud based infrastructures</li> <li>Experience in web-based applications and server management</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Excellent oral and written communication skills, including the ability to listen to and communicate complex information to academic researchers with clarity.</li> </ul>	<p>Experience in some of the following areas will be beneficial; training can also be provided:</p> <ul style="list-style-type: none"> <li>Build Systems – CMake</li> <li>Version control in Git</li> <li>Advanced C++ 11</li> <li>Test-driven development</li> <li>GPGPUs</li> <li>Linux server management</li> <li>Web server management - e.g. Apache / Tomcat</li> <li>Web applications/services - e.g. Spring / Hibernate</li> <li>Cloud computing</li> <li>Containerisation (e.g. docker)</li> <li>Web security</li> <li>Databases</li> </ul>
<b>Experience</b>	<ul style="list-style-type: none"> <li>Significant contributions to writing, maintaining and supporting a piece of scientific software, individually or as part of a larger team.</li> </ul>	<ul style="list-style-type: none"> <li>Research involving scientific computing i.e. numerical simulations using ODEs, PDEs or discrete dynamical systems.</li> <li>Research involving optimisation/inference – e.g. fitting models to data, Bayesian techniques.</li> </ul>



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