

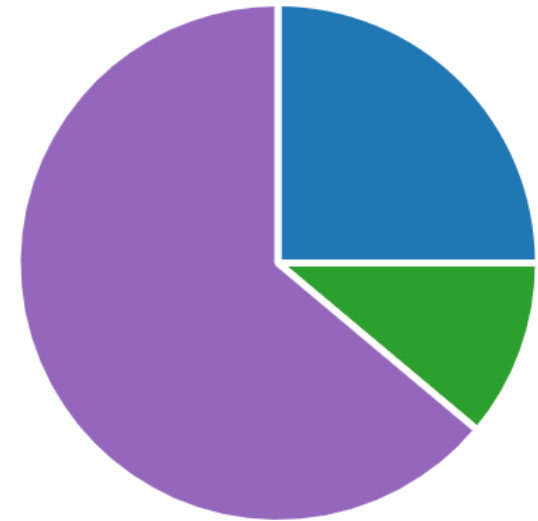
Research Software Engineer Discussion

FoNS RSE Survey in 2023

3. Which department are you from? (0 point)

[More Details](#)

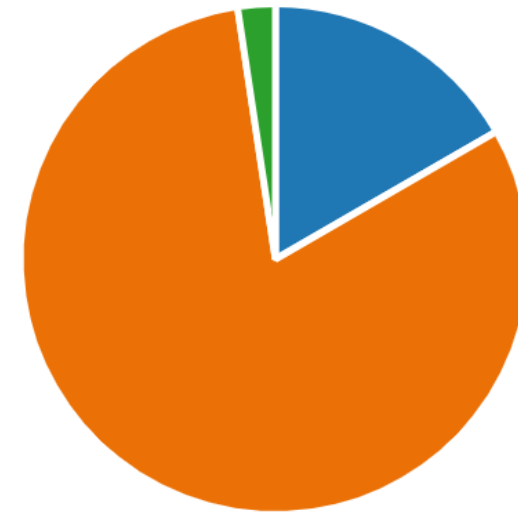
● Chemistry	9
● Life Sciences	0
● Mathematics	4
● Environmental Policy	0
● Physics	23



FoNS RSE Survey in 2023

4. Are these answers related to teaching, research or something else (multiple answers are allowed)?

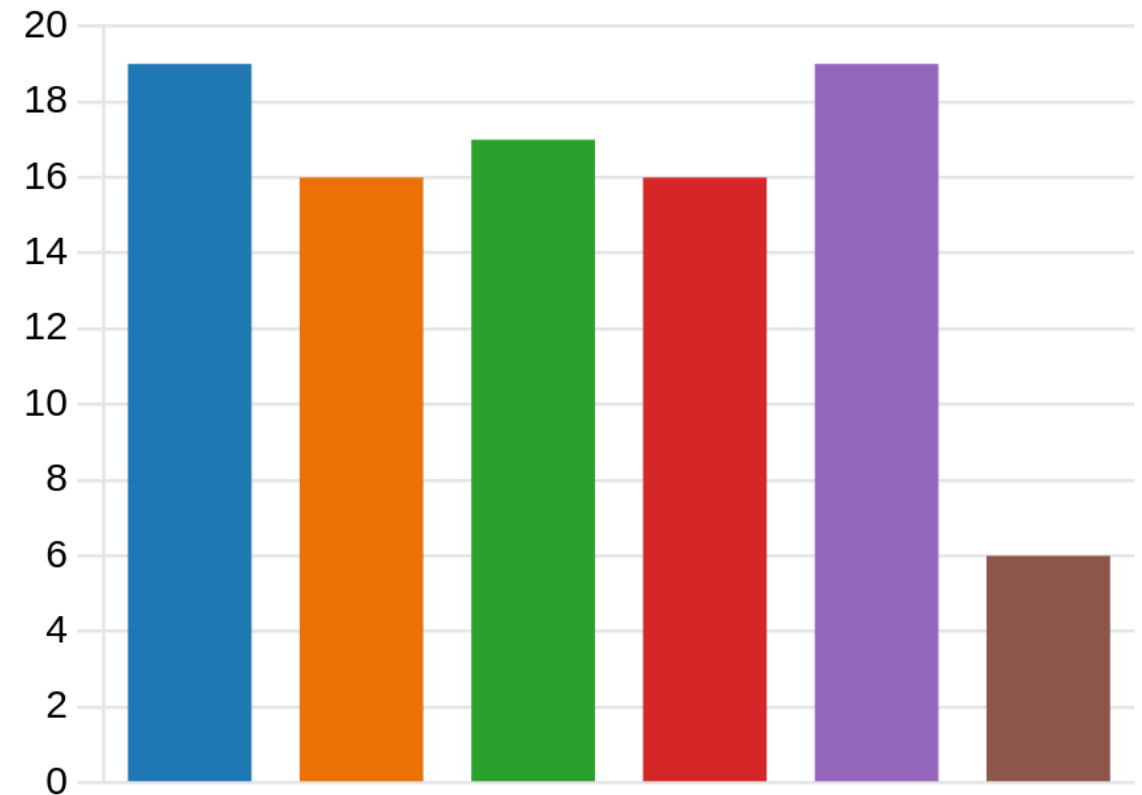
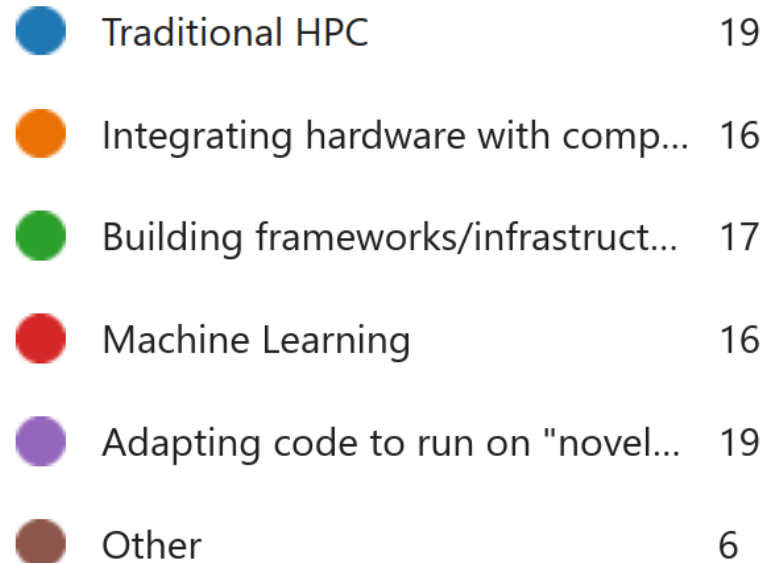
[More Details](#)



FoNS RSE Survey in 2023

5. What skills would you be looking to use in a research software engineer? (0 point)

[More Details](#)



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Other

Embedded low resource highly qualified real-time computing (space instruments); FPGA programming

Allowing software infrastructure developed elsewhere to run on College systems and maintaining that software. We have a lot of bespoke software for various uses - data reduction, analysis, simulation - that is freely available but increasingly difficult to install and maintain on an ad hoc basis without specialist skills. We used to have a system manager who could help with this but that has long been deprecated. We also at times help to develop such infrastructure (eg. for Herschel or Planck). There is often software engineering support for such work in these projects. Having a software engineer on site already might allow us to allocate some of this individual's effort to such projects as and when it is needed.

Not exactly sure - I have mostly been doing stuff myself (learning where needed), but that is not the most efficient way to do things. I have hired RAs for specific algorithm development though.

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Other

Expertise in the ML latest methods and software, with a particular knowledge of suitability for different problems.

Building graphical front ends to make code available for wider use.

CI pipeline development with gitlab

System support for linux machines - ICT are signalling failing in this and it is needed if we are to have a reliable, consistent computing environment that does not rely on 'shadow support' that can disappear when the expert postdoc leaves.

Code parallelization;

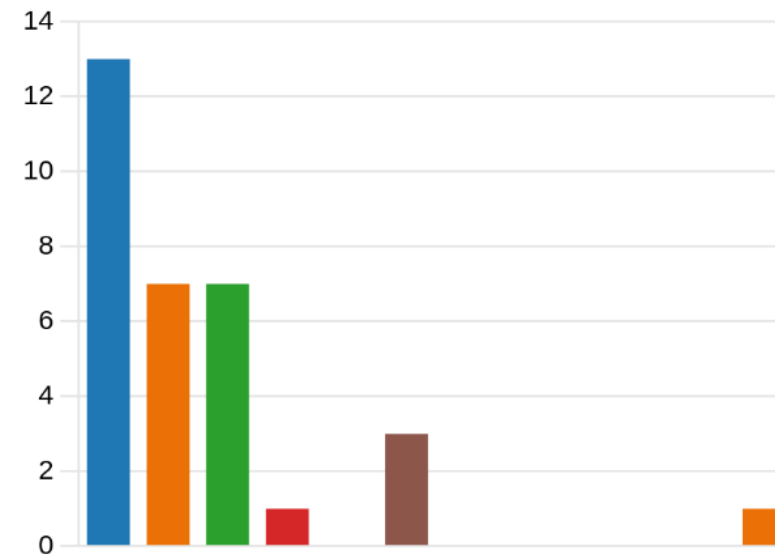
Ability to pick up specific coding tasks within our software libraries Support for building our software on different HPC systems

FoNS RSE Survey in 2023

7. While usage of such a resource may be patchy, typically how many months a year would you want to use a software engineer?

[More Details](#)

1	13
2	7
3	7
4	1
5	0
6	3
7	0
8	0
9	0
10	0
11	0
12	1



FoNS RSE Survey in 2023

8. For research use would you be happy to put research software engineer time on your grants as:

[More Details](#)

Researcher time (i.e. attracting o... 6

Support staff time (i.e. not attra... 24

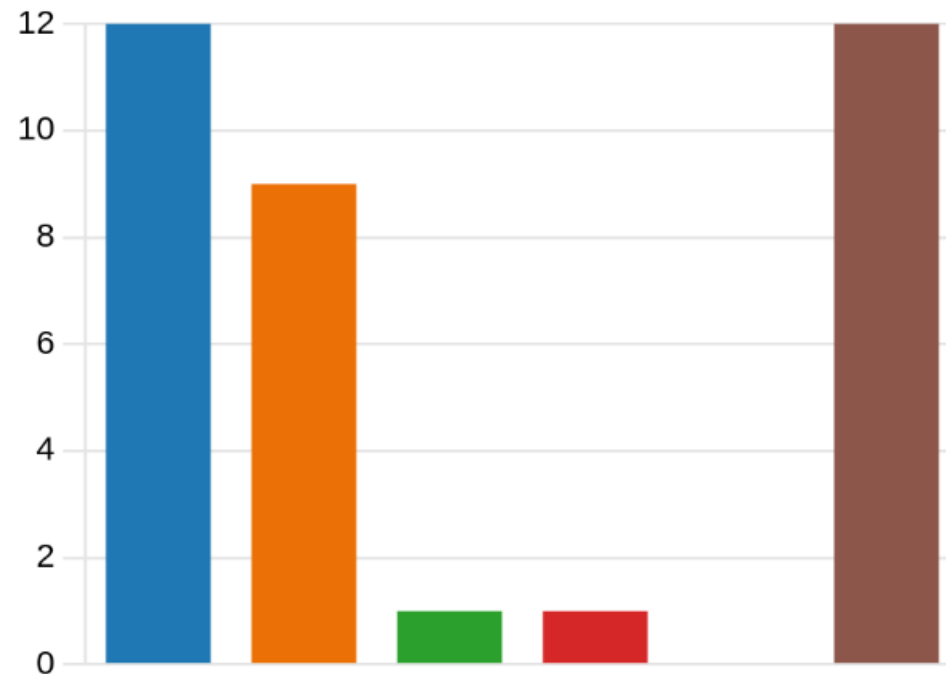
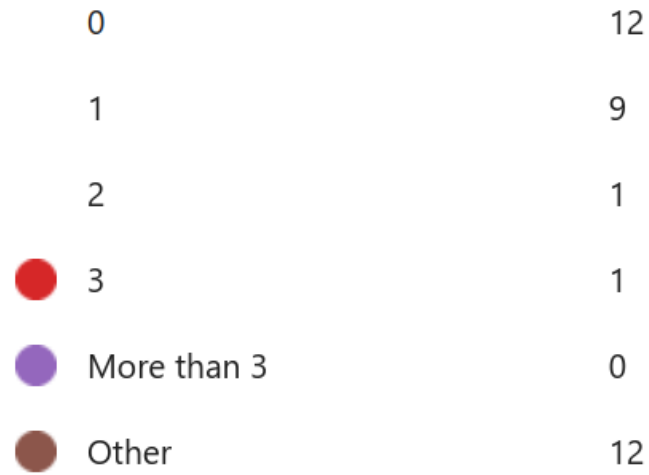
I would not be happy asking for... 3



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9. Do you have people in your team who you would consider to be research software engineers (either part time or full time)? These could be academic staff, students, RAs, technicians or some other roles. If so how many?

[More Details](#)



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10. If you do have software engineers in your team, typically, what fraction of their time is spent performing software engineering?

[More Details](#)



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11. If you do have software engineers in your team, would they welcome being part of of community in which they share knowledge and best practise?

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Is there anything else that we should know in this area?

The problem, as always, is getting good people.

In general I think the software engineer role can cover a lot of different tasks, and the time spent on the project will be different. Long term support of data storage, for example, compared to porting code to a GPU. It is very difficult to say whether these posts would incur overheads and to say how many months a year they would exist for - some projects would require a sustained low level of support but others would need months of dedicated work. The 3 months per year above is an estimate, integrated over the year.

Once in a while, we (academics, RAs, PhD students) need to come up with new software solutions, usually adapting existing ones but often bringing in new, or more up-to-date, ideas. It would be nice to be able to talk to professional programmers who can advise, suggest existing frameworks to use, and generally ensure that such new code is not written in a wasteful or misguided way.

Research software underpins my work in particle physics. I maintain a 140,000 line code repository for Bayesian statistics. We would benefit greatly from professional software engineering assistance.

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Is there anything else that we should know in this area?

In same cases it would be useful to use RS for teaching

The answer to most of the above question is "it depends". I have multiple projects with different demands

There is a need for professionalism in this area, use of modern tools and development approach. For us, projects go up and down on timescales of ~few years but some last for a decade or more.

Existing ICT support for installing and maintaining specialist software is essentially zero - 'we just install operating systems' is what they say - but we need system level help to install and support a number of packages on various operating systems eg. IDL. ICT has as policy left us high and dry, and it is only thanks to some individuals at ICT being helpful and going beyond the stated policy that we have been able to cope. If those staff leave, or if the goodwill goes away, then we will have a serious problem.

If research software engineers become available, for me the most valuable contribution would be at the strategic level, particularly frameworks for data management, creating maintainable experimental control software and data analysis. Our experiments are small-scale and the control and analysis code has to be flexible; all members of my team should be able to contribute to the software engineering and modify the relevant code so I wouldn't want to "farm out" routine software development to a software engineer, but having advice on major strategic decisions would be very welcome.

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Is there anything else that we should know in this area?

We use software for automating complex experiments, acquiring data and analysing data. It has been developed over 20 years and is sophisticated. But there is no continuity of support. Sometimes we'll get a student or postdoc who enjoys software engineering and is able to maintain and develop the code. But most students and postdocs do not want to spend their time on this. This lack of continuity and absence of expertise is a big problem.

The RSE staff I have are not explicitly RSEs, but have a role that is primarily algorithm development for new instrument systems (so could potentially be an RSE-like role).

I'm trying to estimate the time an RSE would be used, but I can imagine this expanding/contracting depending on the RSE's workload and skills. My research would benefit from a skilled software engineer to help develop software frameworks, and this could grow to be a large amount of work (therefore would need funding on a grant). Traditional HPC would be more as a support role that is currently fulfilled by the GridPP team. For ML and novel hardware, this would be useful for speculative funding bids (e.g. ICICLE) - I would currently rely on an RA in the HEP group with this knowledge, but a dedicated person would probably be better.

The person in my team is presently based at the University of Porto. I am expecting the result of a major grant proposal that I intend to partially bring here, in which case being able to support a research software engineer via this grant would be a possibility.

FoNS RSE Survey in 2023

Is there anything else that we should know in this area?

Effective software engineering is essential for future needs of the department. Key to data management, storage, FAIR data principles, internal and external facing data systems, AI/ML, streamlining of internal admin process

How much I would use research software engineers rather than postdocs who are experienced in research software and physics would depend almost entirely on cost comparison

My former PhD student Dan Cummins has become an Imperial RSE, he might have thoughts in this area from the RSE side as a recent transition.

We have use RSE supported by grant funds with mixed success. Success when there was a skilled PhD student who could collaborate with RSE. Lack of success when the computing development (RSE) and the theoretical methodology were too intertwined Thus putting a database search into existing. Lack of success when to RSE part was to combine MPI and OMP developments where the theory needed to be reworked and the PhD student did not have the skills to guide the RSE. So this aspect needs a complete re-think

FoNS RSE Survey in 2023

Is there anything else that we should know in this area?

Hopefully this would lead to a more modest costing than what is currently offered by the College. In my research, would probably prefer to employ a postdoc with programming skills that can also do the science.

It doesn't work to think of RSE as a service. What we need is sufficient training for everyone involved in research.

So, what now ?

- Do we need/want to support an RSE activity?
 - If "No" then we can stop now.

If we do want to support such an activity, what do we want to achieve?

- For the RSEs:
 - Employment stability
 - Career develop – both in learning new skill/training and promotion ladder
 - Part of department(/Faculty?) wide community?
 - What else?
- For the research/teaching communities:
 - Ability to get timely support with the computing/software
 - This support should (where appropriate) include training of/working with members of that community
 - What else?

If we do want to support such an activity, what financial model do we use?

(At least) Two possible approaches:

Underwriting people in existing communities:

Pros:

- Supports existing people
- ...

Cons:

- Makes agility difficult
- Hard to bring in new people with new skills unless initially grant funded
- ...

If we do want to support such an activity, what financial model do we use?

Employ the RSEs by the Department and charge out on (flexible?)
Track charging

Pros:

- Easy to provide career stability
- ...

Cons:

- Harder to name specific people on grants
- Harder to have long term attachments to specific research community?
- ...

If we do want to support such an activity, how
do they work closely with RSC RSEs?

?

What next?

