Research Directions for Multi-Disciplinary RSE Research to Impact RSE Practise

Panel @ RSECON24

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Panellists

- Wilhelm Hasselbring
(chair, Kiel University & University of Southampton)

- Michelle Barker
(Research Software Alliance, Australia)

- Neil Chue Hong
(University of Edinburgh)

- Simon Hettrick
(University of Southampton)

- Inga Ulusoy
(University of Heidelberg)
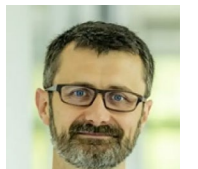
RSE Research

Research Software Engineering   Software Engineering Research

Research Software Engineering Research
aims at understanding and improving how software is developed for research.

RSE Research, in short.

RSE Research should be a multi-disciplinary endeavour, involving disciplines such
as software engineering, sociology, economics, and psychology, among others.

[Felderer et al. 2023, 2025]

Follow-Up

- Following the panel, we will provide an online questionnaire to assess the relevance of the discussed research questions and hold an online meeting to present the results.
    - The questionnaire uses Google Forms, login is optional.
    - I'll announce the availability of the questionnaire via the RSECon24 Slack channel.
- Please assess the discussed RSE Research questions concerning their **relevance** to impact RSE Practise.
- Check https://irser.github.io/ (this link is in the panel abstract) for updates and links to the questionnaire and the meeting:
    - Friday, September 6th, 2024 at 10:30 h BST (UK time) via Zoom.
- You may also find these slides there.
- Charter a new ReSA task force on RSE Research?

<ReSA>

Research Software Alliance

RSE Research Questions

Jeff Carver:

- What are the characteristics of RSEs (or their research context) that make them more or less likely to embrace traditional SE practices (e.g. requirements, design, or testing)?

Caroline Jay:

- Which are the essential skills for RSEs?

Michelle Barker:

- How do we enable recognition of RSE work in recruitment and promotion?

- How are RSE groups funded?

- What proportion of funding should be dedicated to the research software elements of research?

RSE Research Questions

Neil Chue Hong:

- Can we categorise research software based on software engineering analysis, and are there any significant differences from other types of software?

- What is the economic impact of research software, and how might we define "return on investment" in a sensible way?

- How do we define the critical research software that underpins research, and the impact if it was not available?

RSE Research Questions

Simon Hettrick:

- What are the key points during a research project at which an RSE should be involved to maximize the impact of their involvement?

- What are the most effective methods for sharing knowledge about different software projects across a group of RSEs?

- What practical methods do RSEs use to determine the cost of requirements gathering?

RSE Research Questions

Inga Ulusoy:

- What are the stages in the life cycle of a research software and what characteristics define these? [i.e. prototype (TRL1-3) - lab software (TRL4-6) - research infrastructure (TRL7-9)]

- What enables or hinders a transition from one stage to the other, and what type of support would be needed to facilitate a transition?

- What are the main technical aspects that are relevant in the transition?

Wilhelm Hasselbring:

- Which categories of research software require which software architectural structures / styles?

References

[Felderer et al. 2023] Felderer, M., Goedicke, M., Grunske, L., Hasselbring, W., Lamprecht, A. L. und Rumpe, B.: "Toward Research Software Engineering Research". 2023. DOI https://doi.org/10.5281/ZENODO.8020525

[Felderer et al. 2025] Felderer, M., Goedicke, M., Grunske, L., Hasselbring, W., Lamprecht, A. L. und Rumpe, B.: "Investigating research software engineering: Toward RSE Research". Communications of the ACM, 2025. DOI https://doi.org/10.1145/3685265