Research software landscape and stakeholders

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Research Software – Tools for Research

• Empirical evidence – Scientific Theory – Computational Science – Data Science

• Growing importance of software
  – survey SSI 2014:
    • 92% of academics use research software
    • 69% say that their research would not be practical without it

- further international surveys
Research Software

- Tool for research work
- Reproducibility of scientific results
- Software as a result of scientific work
- Software as resource
- Sustainability
- FAIR Principles for software:
  - Findable, Accessible, Interoperable, Reusable
- activities: SSI, RDA Working Group, ReSA, ..., EGU, ..., FORCE11, ...,
Research Software

Types of software
• Research codes
• Frameworks used in research, e.g. Matlab
• Services, e.g. Zenodo

Stakeholders:
• Management
• Developers
• Users
• Infrastructure facilities
• Funding Agencies

Relation to software
• Developing
• Using
• Providing
• Working Group Open Science
• Taskgroup Research Software

• „Dealing with research software: Recommendations for best practices“ (2019) http://doi.org/10.2312/os.helmholtz.003

• Guidelines for Sustainable Research Software Development
  – Good practices in Software Development and Documentation
  – Software Quality – incentives for writing well documented code
  – Need for training and education in software developing skills

• Project HIFIS - Helmholtz Federated IT Services, working package on Software
Alliance of German Research Organizations

- represents universities, research organisations, DFG and others
- Priority initiative “Digital Information”

Aims:
- Increase awareness on importance of software use and development in the scientific process
- Identify open issues
- Provide recommendations to the various stakeholders in scientific software development

- Work in progress: Terms of Reference for software development in research institutions
New update of codex 01.08.2019

In contrast to earlier versions, software is mentioned

Some aspects:
- Open Access: all used data, materials, methods and software have to be made available
- Software source code must be made persistent and citable, as well as documented.
- Authorship in data and software
- books and journals → repos for data and for software
"Software is 95% human and only 5% code*"


The Reproducibility Guru
- Learns lots of software tools in order to make his research reproducible

The Software Person
- Is hired to work on software for a research project

The Geek
- Writes software as part of her research project
- Would like to code more, but needs to think about her career and write papers

The Researcher
- Needs analysis scripts (or other software skills) for her research
- Learns what she needs

The Go-to Person in case if problems
- Knows how to solve all kinds of computer problems
- Is hired to work on other things but is kind enough to help because he likes it

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• Founded 2018, [www.de-rse.org](http://www.de-rse.org)

• Aim (statutes)
  – Ensuring sustainability and verifiability of research software development as part of research processes
  – Improved perception of the role of software in research
  – Opening up of scientific software as a central building block in Open Science
  – Publication of Software
  – Professionalization of software development
  – Integration into higher-level activities, for example in the context of e-science and e-infrastructures
  – Increasing the attractiveness of the occupational field → career paths
– First conference 04.-06.06.2019
deRSE19 in Potsdam (AWI, GFZ, PIK)
– More than 130 submissions (talks, posters, workshops)
– community building

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Summary

• Increasing awareness for research software
• Policies and Guidelines
  – Support in daily work
  – Responsibility of institution to provide training
  – infrastructure
• Community building
  – Take part – network
  – www.de-rse.org

GESELLSCHAFT FÜR FORSCHUNGSSOFTWARE

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