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:

    S. J. Hettrick et al, UK Research Software Survey 2014, DOI:10.5281/zenodo.14809)

    - 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:
  - **F**indable, **A**ccessible, **I**nteroperable, **R**eusable
- 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

Helmholtz Association

- Working Group Open Science
- Taskgroup Research Software
- Position paper about Research Software (2017) https://os.helmholtz.de/?id=2766

- „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”
- Working group “Digital tools: software and services” (2018-2022), former ad-hoc working group “Scientific software” (2016-2017)

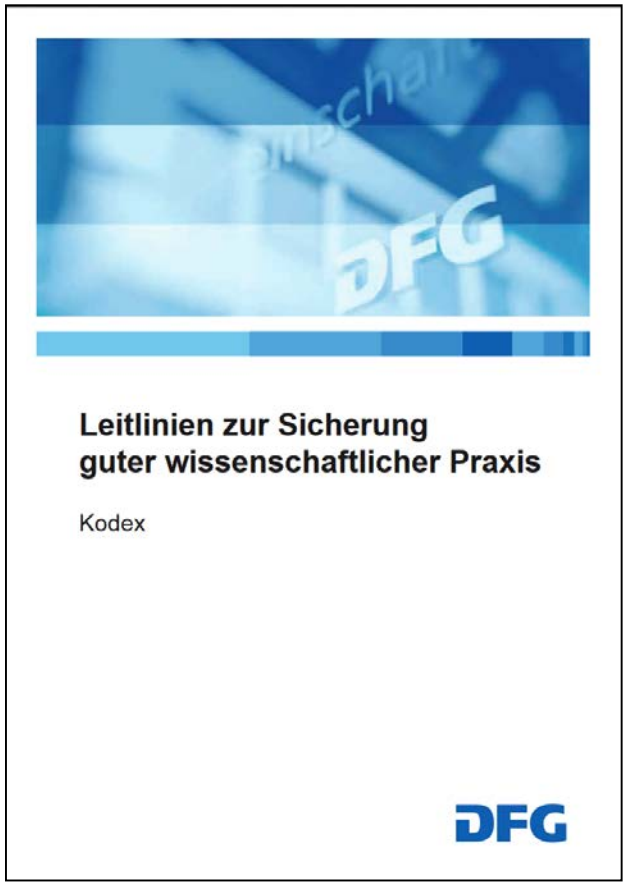
Aims:

- 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

- Guidelines on the Development, Use and Provision of Research Software (2018) http://doi.org/10.5281/zenodo.1172970
- Work in progress: Terms of Reference for software development in research institutions

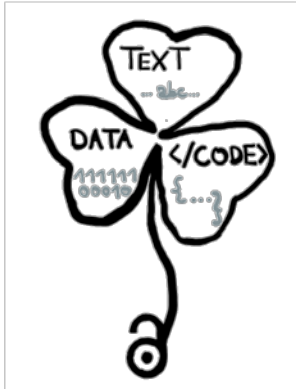
Good Scientific Practice - DFG

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*“

* Eric Albers, CCC2019, https://media.ccc.de/v/thms-49-ber-die-nachhaltigkeit-von-software

The Reproducibility Guru

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

The Researcher

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

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 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

de-RSE e.V. – Society for Research Software

- Founded 2018, 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

de-RSE

- First conference 04.-06.06.2019 deRSE19 in Potsdam (AWI, GFZ, PIK)
- More than 130 submissions (talks, posters, workshops)
- community building

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

de RSE | GESELLSCHAFT FÜR FORSCHUNGSSOFTWARE