Research Software Community Leiden

Software in the spotlight: launching the Research Software Directory

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Software is hugely important for research, but it’s not very visible as a key research output. We present the Research Software Directory (RSD), an online service designed to put research software in the spotlight. The RSD showcases software to the research community and promotes its reuse and impact. The platform is the result of a collaboration between the eScience Center, the Helmholtz association, Utrecht University, Leiden University and Amsterdam UMC.

On 22 November, the RSD will officially launched during an online event.

At the end of 2021, NASA launched the James Webb Telescope to peer into galaxies that appeared billions of years ago. The stunning images the telescope is capturing (like the pillars of creation below) continue to wow everyone remotely interested in science and the history of our universe. Open source software is powering the tools that astronomers use to work with the telescope. From the core data pipeline used to process raw images into science-ready data, simulation tools to help astronomers understand how to best use the telescope, to the tools that astronomers use to make new discoveries, open source is at the center of these exciting scientific discoveries.

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It’s not just astronomy that benefits from openly available research software. Researchers would not be able to model predictions of climate change without software, or interpret ancient texts using natural language.
processing algorithms. Even “simple” statistical tests often rely on custom scripts, written by researchers —
this is software too. Software is developed and used in most instances of research, and in many cases it is the
software that’s pushing the boundaries of what is possible. That’s not just because of advanced technologies in
AI and computing: any kind of open source software can be a building block for the next researcher’s big
discovery.

Even though being able to share and access software is hugely important, software is not very visible as a key
research output. Existing software can be difficult for researchers to find, leading many to reinvent the wheel
by creating their own from scratch. And even when software is openly shared and reused, the work often does
not get recognized as an important part of the developer’s academic output.

The Research Software Directory

The Research Software Directory (RSD) presents a solution. RSD entries display software within its research
context, so users can quickly gauge if a piece of software suits their needs. If they decide it does, the RSD entry
contains all the information they need to reuse and cite the software.

The system harvests information from sources like GitHub, Zenodo and ORCID, and presents associated data,
projects, scientific papers and other publications. The pages also show social context — who the developers
are, how active the development is, and linked tutorials, blog posts, or videos. The RSD is an open.
source system that’s built using common standards, allowing it to link to other services in the open science ecosystem.

The RSD has been in use by the Netherlands eScience Center as a prototype for several years. Open source software for research lies at the heart of the mission of the Center. The eScience Center collaborates with researchers across all disciplines to create high-quality open software for academic research. The RSD was initially used to collect the software developed in these collaborations. After ample outside interest, a team of developers from the eScience Center and the Helmholtz Association has transformed the RSD into a service that can be used by all researchers and research organizations.

**Focus on research software at Digital Competence Centers**

As the result of a project funded by SURF, several Digital Competence Centers (DCCs) in the Netherlands are now implementing the RSD at their research organization. As centres of expertise in data, software, and computing for research organizations, the DCCs are well-positioned to facilitate the use of the RSD by their researchers.

Many of the DCCs have sustainable software development and maintenance high on their agendas. For instance, at AmsterdamUMC, the majority of research groups develop software, especially for statistical analysis, genomics, image processing, data curation, Natural Language Processing (NLP) and machine learning. The AmsterdamUMC DCC is formulating guidelines for researchers with tips and tricks to enhance software quality and performance. Essential infrastructure such as software repositories, software management plans and courses to educate researchers are also in development. And soon, Amsterdam UMC will showcase its research software products in the RSD to promote the reuse of research software and to foster the appreciation of software as research output in the biomedical sciences.

In July, Leiden University welcomed Dan Rudmann, their first Digital Scholarship Librarian with a specific focus on research software. Dan is initiating the Research Software Community Leiden and supporting the Leiden DCC. This involves bringing together people at the university who have an interest in research software to generate practices and protocols that are FAIR, open, and secure. Leiden University is also establishing software management plans and policies. The RSD is a boon to this work.

At Utrecht University, researchers and research software engineers at each faculty develop research software. Utrecht University has a central Research Data Management Support group that’s similar to other institutions’ DCCs. The software and data experts in this group develop research software in joint projects with UU researchers and provide them with training and advice. Utrecht University’s GitHub organization contains over 200 repositories, 100 members and 25 teams, where UU staff share and collaboratively develop research software. The Research Data Management Support group offers elaborate manuals and interesting, well-documented projects as inspiring examples to make it easy and attractive for researchers to use this organization.
Utrecht University recently started registering their research software in the RSD. The Research Data Management Support group plays an active role in campaigning for their colleagues to add their software to the RSD. As Martine de Vos, team lead of software engineer for the RDM Support group puts it: “We want to increase the impact of our own software, but we are also highly interested in the work of our colleagues at other institutions. We hope many researchers will register their software in the RSD, as we think size matters.”

**Community adoption of the RSD**

For the near future, the RSD team aims for wider adoption of the service by the research community. To an extent, this is already happening: Dutch and international research organizations are already joining the effort to make research software more visible by signing up for the RSD.

The collaboration with the DCCs will answer important questions about how the RSD can be embedded within organizations. For example, which underlying tools or infrastructure are required or helpful (e.g. a central GitHub or Gitlab instance), how it fits into workflows and roles (e.g. who should be responsible for entering software), what type of support is needed (e.g. on choosing licenses), and how it relates to institutional policy on software. The RSD team will publish their findings from the collaboration, so organizations across the world can learn how to best implement the RSD.

On 22 November, the RSD will be officially launched during an online event. If you want to learn more about the RSD or have questions about implementing it at your organization, [register here](#) for the launch.