## deRSE25 and SE25 Timetables



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## Empirical Analysis of Software Quality Assurance Practices in Research Software

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As scientific research increasingly relies on software to handle complex data, limited formal training in software development among researchers often leads to issues with documentation, code reliability, and reproducibility. In this study, we conducted an empirical analysis of 5,300 open-source research repositories, focusing on practices aligned with FAIR4RS recommendations. Python was the most common language (36%), followed by R (17%) and C++ (8%).

Our findings reveal that around 75% of repositories included a license, 20% were registered in community registries, and 25% offered citation information, reflecting initial adoption of FAIR recommendations. Basic documentation was inconsistent, with installation instructions included in 47% of repositories and usage guides in 45%. Software quality practices varied: only 0.3% used a software quality checklist badge, test folders were found in 35%, and 41% implemented continuous integration (CI). Additionally, for Python, R, and C++ repositories, 69% explicitly defined dependencies through configuration files.

In further analysis, we will examine adherence to community-specific guidelines for test case organization, explicit dependency requirements, and automated tasks within CI tools, as well as assess the influence of contributor count on these practices. This poster invites the research software community to discuss the benefits and challenges of adopting FAIR4RS recommendations and quality assurance practices to enhance software quality and reproducibility.

## I want to participate in the youngRSE prize

no

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