Introducing the Actionable Guidelines for FAIR Research Software Task Force

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Main Text of Abstract

Research software is a critical element of modern scientific research. Making it Findable, Accessible, Interoperable, and Reusable (FAIR) is crucial for fostering reproducibility, promoting transparency, ensuring sustainability, and accelerating scientific progress. The FAIR Principles for Research Software (FAIR4RS Principles) were established in 2022 through a global initiative to provide a general framework for making software FAIR. Similarly to the original FAIR Principles they were inspired from, the FAIR4RS Principles remain aspirational by design and do not provide concrete implementation instructions. The FAIR Biomedical Research Software (FAIR-BioRS) Guidelines were established to provide actionable instructions for making biomedical research software compliant with the FAIR4RS Principles. These Guidelines were presented at BOSC 2022 and 2023 and received considerable input from the BOSC community, especially during CollaborationFest, before their publication in 2023. These guidelines have not received cross-discipline community input, which is necessary to generalize them to any software outside of biomedical research. Such domain-agnostic guidelines are needed to make any research software FAIR, as revealed by a survey of the research software community conducted in 2024 by the FAIR4RS Working Group.

To address this gap, the Research Software Alliance (ReSA) established the Actionable Guidelines for the FAIR Research Software (Actionable FAIR4RS) Task Force in December 2024. The Task Force, initiated by an author of the FAIR-BioRS guidelines, is formed of a diverse international team of researchers and research software developers from various fields including biomedical research, data science, and knowledge representation. The goal of the Task Force is to provide actionable and domain-agnostic guidelines for implementing the

FAIR4RS Principles to make research software FAIR. The Task Force's approach is novel in its comprehensive, community-driven methodology. Building upon the foundation laid by the FAIR-BioRS guidelines, the Task Force began by conducting an in-depth analysis of the FAIR4RS Principles and identified six key categories where actionable instructions were needed to comply with the principles: Identifiers, Metadata for software publication and discovery, Standards for inputs/outputs, Qualified references, Metadata for reuse, and License. Six dedicated sub-groups are now conducting thorough literature reviews and community outreach to identify how the requirements of each category can be practically satisfied. Some of the challenges include identifying suitable identifiers, archival repositories, and metadata standards across research domains.

In our presentation, we will provide an overview of the Task Force, present its current progress, and outline opportunities for community involvement in shaping these guidelines. We will also explain how the FAIR-BioRS guidelines have now led to this global effort. The Task Force is dedicated to making all its outcomes openly available (CC-BY-4.0 license). This initiative will significantly benefit the biomedical open-source community by providing generalized guidelines to make software FAIR that applies beyond just biomedical software, which is critical to prevent siloed practices and drive cross-discipline collaborations.