

# RO-Crate: packaging metadata love notes into FAIR Digital Objects

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The Helmholtz Metadata Collaboration aims to make the research data [and software] produced by Helmholtz Centres FAIR for their own and the wider science community by means of metadata enrichment [1]. Why metadata enrichment and why FAIR? Because the whole scientific enterprise depends on a cycle of finding, exchanging, understanding, validating, reproducing, integrating and reusing research entities across a dispersed community of researchers.

Metadata is not just “a love note to the future”[2], it is a love note to today’s collaborators and peers. Moreover, a FAIR Commons must cater for the metadata of all the entities of research –data, software, workflows, protocols, instruments, geo-spatial locations, specimens, samples, people (well as traditional articles) –and their interconnectivity. That is a lot of metadata love notes to manage, bundle up and move around. Notes written in different languages at different times by different folks, produced and hosted by different platforms, yet referring to each other, and building an integrated picture of a multi-part and multi-party investigation. We need a crate!

RO-Crate [3] is an open, community-driven, and lightweight approach to packaging research entities along with their metadata in a machine-readable manner. Following key principles - “just enough” and “developer and legacy friendliness” - RO-Crate simplifies the process of making research outputs FAIR while also enhancing research reproducibility and citability. As a self-describing and unbounded “metadata middleware” framework RO-Crate shows that a little bit of packaging goes a long way to realise the goals of FAIR Digital Objects (FDO)[4], and to not just overcome platform diversity but celebrate it while retaining investigation contextual integrity.

In this talk I will present the why, and how Research Object packaging eases Metadata Collaboration using examples in big data and mixed object exchange, mixed object archiving and publishing, mass citation, and reproducibility. Some examples come from the HMC, others from EOSC, USA and Australia, and from different disciplines.

Metadata is a love note to the future, RO-Crate is the delivery package.

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