## BACHELOR'S THESIS / MASTER'S THESIS / HIWI-JOB

Communication Interfaces
between **Scientists, Machines, and Databases**
for **Data-Centric Machine Learning**

Background

The digital transformation of experimental labs is an indispensable stepping stone in the broader application of machine-learning-based methods which tackle longstanding scientific challenges. One of the potential routes for converting data into knowledge is through the application of the FAIR (findable, accessible, interoperable, reusable) data principles. Fully applying these principles, however, requires a gentle balance of utilizing solutions like ontologies and virtual research environments, and the components that ensure the robust communication between these technologies and human operators.
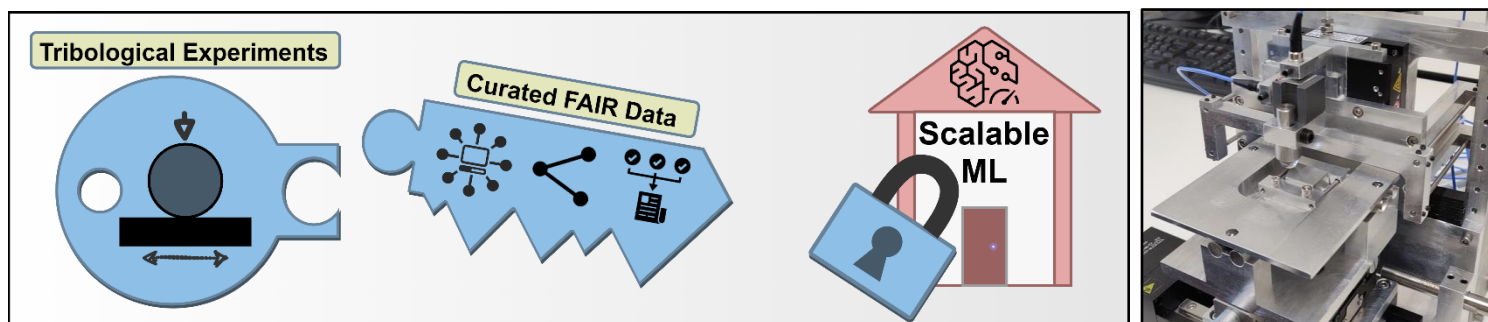
Friction and Wear Tester

Objectives

The specific objective of this project is to engineer the front- and back-end infrastructure for effective communication between lab scientists, ontologies, and Kadi4Mat. Proof-of-concept work in that respect has already been performed and published (Brandt *et al.*, 2022, https://www.mdpi.com/1465596). Thus, this project will step on existing expertise, and the outcomes will be immediately applied in an experimental lab.

Requirements

Students from the field of computer science (or related) are encouraged to apply. The applicant will be part of an active and diverse team of data scientists, experimental scientists, and mechanical engineers. Interest in material science is an advantage, but not a requirement. Experience with Python, Django, JavaScript, OWL and git are also an advantage.

Possible start: as soon as possible

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