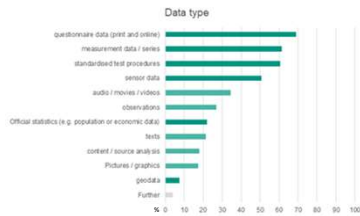


RC Protected Data Spaces with UC Sensitive data in sports science



Keller, K., Peger, A., Nessler, C. et al. The status quo of research data management in the German-speaking sports sciences—Results of an online pilot survey. *Ger J Exerc Sport Res* (2025). <https://doi.org/10.1007/s12562-025-00303-0>

MO|RE data platform

first repository in sport science

Benefit

- Archiving, Publication (DOI), 68k raw data sets
- only motor research data
- only anonymised data

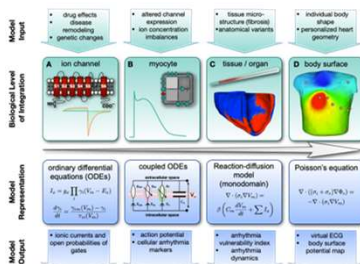
Challenges

- handling sensitive health and personal data (e.g., BMI, blood pressure, geolocation, etc.)

Goals

- Expand it for further data types
- Implement secure access to sensitive data
- Ontology for motor performance data → Knowledge Graph

RC AI-Based Knowledge Realms with UC Artificial Intelligence in Biomedical Engineering



Research Interests

- Big data and ML hold great potential to
 - speed up diagnosis & make it more accurate
 - personalise treatment
 - reduce costs & redistribute human effort

Challenges

- “big data but small data” paradox
- data access restrictions (medical context)
- insufficient label quality and data curation

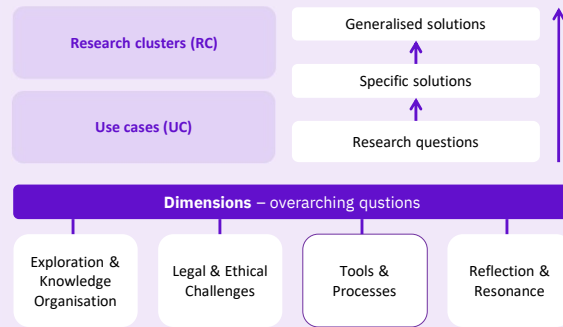
Potential Solutions

- Data augmentation
- Federated learning
- Research data donation
- In silico data
- Independent, representative test sets
- Minimum reporting standards
- Data & code sharing: Open Science
- Benchmark datasets with well defined ground truth (e.g. in silico)

Goals

- building trustworthy AI models of the human heart for predicting cardiovascular diseases.

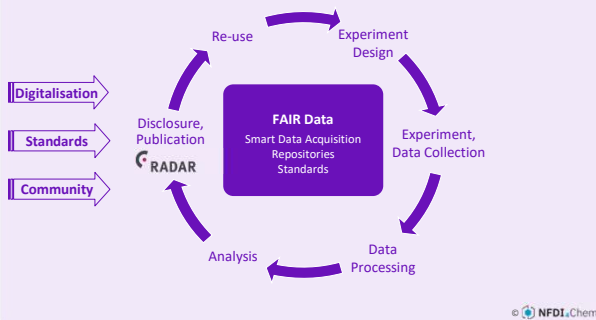
Project overview



Planned Outcomes

- Create **new research branch: Digitalisation of Research**
- Deliver **real solutions for real problems, then generalise**
- Establish **best practices** (ethical / legal / secure)
- **Engage with society** and strengthen **trust in science**
- **Spot new digital threats early & shape governance**
- Turn **ideas into spin-off projects** and grow a strong **community**

The data workflow



«our» Dimension: Tools & Processes

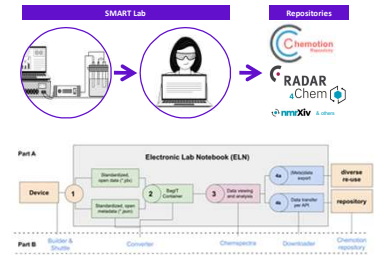
Study and optimise research processes & software tools

- Secure and effective incorporation of AI
- Linking of (distributed) data, physical samples, devices, software etc.
- Automatic assessment and improvement of data FAIRness (score)
- Efficient Big Data handling
- Secure data access for sensitive data
- **Smart Data Acquisition with Electronic Laboratory Notebooks (ELNs)**
 - Smooth interoperability with repositories and other systems
 - Voice-based AI assistants
 - Advanced data curation workflows and tools
- **Research Data Repositories**
 - Automated MD enrichment, semantification and indexing
 - Tracking data reuse and citation
 - Enhancing data safety and security and long-term archiving
 - Data entry, cleaning, and normalisation
 - AI algorithms can process and analyse large-scale datasets

Use of AI in digital science

- Automated metadata extraction, annotation, ontology mapping
- Smart data classification, screening & tagging
- Quality assessment, plausibility checks & error detection
- AI-assisted retrieval & querying (e.g. turn natural language into SparQL)
- Machine-generated reports & insights

RC Smart Data Acquisition with UC Chemotion Electronic Lab Notebook



Challenges

- Reluctance in academic labs to adopt new technologies
- Lack of control over data and reliance on external software, device integration
- Diversity of workflows in chemistry labs

Goals

- Improve suitability and application area of data conversion tools
- Implementing standards for data handling
- Improving **data curation workflows**
 - Implementation of rules and validation, LLM based review of submissions

RC Publication Cultures with UC Large Datasets in Climate Research



Research Interests

- Generating and analysing large-scale chemistry–climate simulations and satellite datasets to understand atmospheric processes and their role in climate change
- Developing methods and tools for efficient exploration, sharing, and re-use of massive atmospheric datasets, enabling targeted subset selection for research and peer review

Challenges

- Up- and download of big data in repositories
- No exploration of big data possible (e.g. map)
- Enabling single file selective download within data sets in RADAR
- Raw data belong to Eumetsat

Goal

- Managing and publishing large climate datasets efficiently
- Enabling big data publication in RADAR

