Health Data Interest Group @VP19

The usage of digital twins in healthcare for personalised care

20th June 2022, 7:00 - 8:30 UTC – Seoul, Dragon City Venue Complex

Co-Chairs: Edwin Morley-Fletcher, Yannis Ioannidis
Federation Motivation

- Practical reasons
  - Cost of centralization too high
  - Volume of data too big and sensitive

- Privacy reasons
  - Sensitive data
  - Rules and regulations
  - Competitive advantage
Federated Platform

- Modelling and simulating health issues
- Exploit the experience of successful / established platforms
- Based on FAIR Principles
Abstract Architecture

Central Node

Front End
- Web UIs & Edge Services
- Secure Access for Sensitive Data
- Dashboards
- Data Visualization

Digital Platforms (e.g., VRE, OpenAIRE)

Services
- Data Models
- Analysis/Simulation/Data Processing
- Curation & Validation
- Standardised Workflows

Machine learning & AI
- Secure Sensitive Data processing

Middleware
- Identity & Access Management
- Sensitive Data Management
- Standardised Workflows management

Federation/Scalability/Resilience/Communication

IaaS/HPC
- JSC
- Secure Sensitive Data Storage
- External cloud services providers

Node (FAIRDOM)

Node (Data)

repository
Federated Repository

- **Design**
  - FAIR principles
  - Taxonomy of resources to be included
  - Policy recommendations

- **Catalogue**
  - Inclusion criteria and mechanisms
  - Interoperability standards
  - Gateway architecture

- **Standardization**
  - Data input (metadata harmonization, interoperability)
  - Modelling (model building, formatting, semantics, annotation)
  - Model simulation (reprod, parameterization, description, execution)
High-Level Architecture (for brain)
Multi-Level Twins (for brain)
Physical Deployment Complexity (EBRAINS)
Long and Exciting Way Ahead!