

Archetype-based approach for modelling of electroencephalographic/event- related potentials data and metadata



PAPEŽ, V. *Archetype-based approach for modelling of electroencephalographic/event-related potentials data and metadata*. 1. vyd. Plzeň : neueden, 2017, 170 s. ISBN: neuedeno

Currently, there is no common data standard in the experimental electro-encephalography/event-related potential (EEG/ERP) domain. Existing standardization efforts are mainly based on the conventional approaches and use generic data formats and containers (e.g. HDF5, odML) popular in the research community. This work draws on the medical/health characteristics of EEG/ERP data and investigates the feasibility of applying openEHR (an archetype-based approach for electronic health records representation) to modelling data stored in EEGBase, a portal for experimental EEG/ERP data management. The work evaluates re-usage of existing openEHR archetypes and proposes a set of new archetypes together with the openEHR templates covering the domain. The main goals of the work are to (i) link existing EEGBase data/metadata and openEHR archetype structures; (ii) propose a new openEHR archetype set describing the EEG/ERP domain since this set of archetypes currently does not exist in public repositories. Apart from that, the work describes common data models (e.g. relational, object-oriented) and compares their expressive power in order to (i) determine the elements, which these models have in common; (ii) build a data model hierarchy according to their expressive power. The work uses the proposed archetypes and their reference models as semantic schemata to derive a specific data model for each level of the hierarchy. Finally, the work describes a newly proposed personal electronic health records system for research purposes, which serves as a first use-case of obtained results.