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Beyond the Brain: MIDS Extends BIDS to Multiple Modalities and Anatomical Regions

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Abstract. Brain Imaging Data Structure (BIDS) provides a valuable tool to organise brain imaging data into a clear and easy standard directory structure. Moreover, BIDS is widely supported by the scientific community and has been established as a powerful standard for medical imaging management. Nonetheless, the original BIDS is restricted to magnetic resonance imaging (MRI) of the brain, limiting its implantation to other techniques and anatomical regions. We developed Medical Imaging Data Structure (MIDS), conceived to extend BIDS methodology to other anatomical regions and multiple imaging systems in these areas. The MIDS standard was developed to store and manage medical images as an extension of BIDS. It allows the user to handily save studies of multiple anatomical regions and imaging techniques. Besides, MIDS improves the classification of multiple images within the structure, allowing the possibility to unify them in a single study to apply on them preprocessing or artificial intelligence algorithms. Finally, the results generated are saved in the derivatives folder.

Keywords. Database, BIDS, Standardization, OMOP

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1. Introduction

Brain Imaging Data Structure (BIDS) has been established as a powerful standard to organize brain imaging data and is widely supported by the scientific community. In order to extend BIDS to other anatomical regions beyond the brain, we have developed Medical Imaging Data Structure (MIDS).

2. Methods and Resutls

BIDS [1] is a standard for storing magnetic resonance imaging data and metadata in a clear and simple hierarchical folder structure. It is supported by several programs and libraries dedicated to the study of medical images (e.g., c-pacs, freesurfer, XNAT, BIDS Validator, among others) and is widely used by research groups.

MIDS [2] expands BIDS structure by including a general template for other anatomical regions (chest, pelvis, prostate, spinal...) and file tags for describing many aspects of the data such as body part, view position, DICOM modality.

3. Conclusions and Future Work

MIDS improves the structure categorization and usability for the user providing a common structure for many projects, which can be helpful in artificial intelligence projects. MIDS is part of a collaboration with the DeepHealth EU project in the guidance and construction of a fully anonymized population medical imaging data lake structure. As part of project TARTAGLIA, a new extension of MIDS is being implemented to make it compatible with the Observational Medical Outcomes Partnership (OMOP) Common Data Model [3].

References

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