

# Open electrical impedance tomography file format: towards a first version

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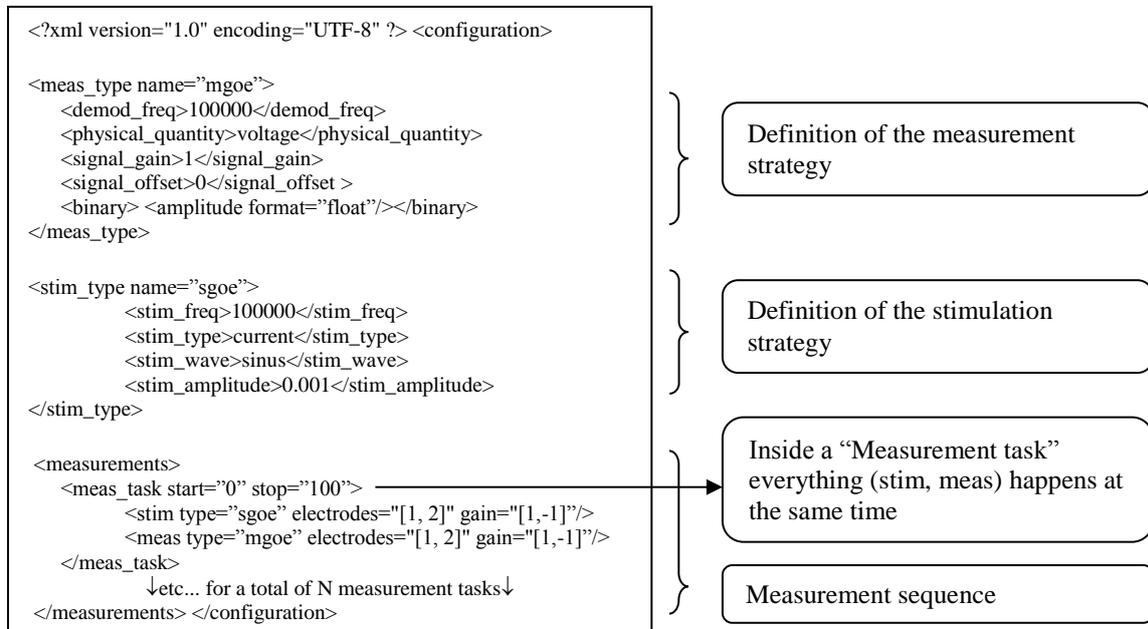
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Retrieving and analyzing historical electrical impedance tomography (EIT) data has become increasingly difficult due to the many different, mostly proprietary, storage formats. This paper describes a project to define a new, well-defined EIT data format, named Open EIT (OEIT).

OEIT is intended as standardized data storage and exchange format, to help bridge the gap between EIT hardware manufacturers, algorithm developers and other EIT data users. EIT data in the OEIT format can be read by anyone with access to an OEIT reader (for which a reference open-source implementation will be provided), and will document the gain, signal synchronization and the stimulation and measurement strategy. This allows an automatic selection of image reconstruction parameters. OEIT can also serve as an exchange format into which legacy EIT data can be converted.

An OEIT file is a structured ZIP-archive (a compressed directory), using similar approach to that of e.g. Microsoft Office (.docx) and Open Document Format (.odt) files. At the top level, the archive contains four directories: “header” - to store file invariant information; “eit” - to store standardized OEIT formatted data; “raw” - to store manufacturer formatted data; and “misc” - to store file and data that do not fit in the above categories. Additional “auxiliary” folders with a structure similar to the “eit” folder can be added to store data acquired at a different frame rate than the EIT data stream

The “eit” folder stores XML-formatted configuration files and binary data files. The binary data are split into blocks, each containing one EIT data frame. A block is preceded by an absolute 64-bit timestamp and an index to the configuration file describing the data acquisition and storage procedure. Configuration files are the backbone of OEIT. For a simple EIT system with 16 individual electrodes (ECG type), pairwise current injection and pairwise serial differential voltage measurement, the configuration file would look as follows:



We are enthusiastic about the potential collaborative advantages of the OEIT file format, for both manufacturers and researchers. The complete specification document and the collaboration platform for user feedback can be found at <https://groups.google.com/forum/#!forum/open-eit-format>.