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The Biosig Project-Getting a Grip on Biosignals

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Biomedical signals like electrocardiogram (ECG), electroencephalogram (EEG), electromyogram (EMG), etc. are (like medical images and clinical laboratory results) an important part of the patient health record. Biosignals are stored in a variety of different data formats. The specifications of about 20 different data formats are available in public.

However, every vendor is using its own data format. A rough estimate yield at least 80 different data formats for biomedical signals. Standardisation efforts were so far only partially successful in some specialised areas like in short-term ECG recordings.

BioSig - the free and open source software library for biomedical signal processing (<http://biosig.sf.net>) provides a software library with a common interface to a variety of data formats. Currently, more than 40 data formats can be read, and over 10 can be written. According to our knowledge, this is more than any other software package in this area. Biosig provides a converter between various data formats, a viewing and scoring tool (SigViewer), and software interfaces to C/C++, Octave/Matlab and Python. These tools are in production use in various research projects. Moreover, a proof-of-concept for a client-server-based archiving system for biomedical signal data is available, too. BioSig is platform-neutral, i.e. it runs on Windows, Linux and MacOSX.

The Biosig tools have been very useful in extracting data from large routine EEG and polysomnographic databases of epileptic patients and neonates (ICU at paediatric department). This enabled the application of new data analysis methods, which were impossible with the original software provided by the vendor. In summary, the common software interface to different data formats ease the handling (exchange and archiving) of biosignal data from different equipment vendors.

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