



Bern University
of Applied Sciences

Research Group HuCE – microLab Esophageal ECG Recorder

Project Description

Cardiac arrhythmias are often asymptomatic and can therefore easily be missed although they ultimately may cause cardioembolic stroke or sudden death. To detect such arrhythmias, cardiologists need a long-term capturing device for ECG signals.

In the project we develop a complete recording system that measures ECG signals from inside of the esophagus close to the heart. As compared to existing Holter devices, our ECG recording system is able to capture long-term signals in a much higher quality.

We develop an E2Corder system consisting of a catheter with multiple electrode sensors and a miniaturized, long-term ECG capturing electronics, housing inside a catheter. We investigate in novel ECG signal-types that result from our esophageal recording, and we research on their clinical interpretability as well as on their signal compressibility with maximum medical signal integrity. With the acquired specific knowledge on esophageal ECG

signals, we thus do research on low-power ASIC circuitry design for signal capturing, conversion and compression in one single step to achieve minimal power consumption and thus minimal overall volume requirements.

A first very important project challenge originates from the highly limited physical space available for the electronics in the sensor-catheter. These limitations ask for new sub-Nyquist signal capturing and low-power compression methods to drastically reduce the required memory size and battery volume. Due the long-term ECG capturing, a second very important project challenge is the research for highly reliable signal morphology classification algorithms simply due the very large data sets to be automatically analysed.

Project Partners

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Partners: Prof. Dr. Dr. med. Rolf Vogel, Dr. med. Andreas Haerberlin (University Hospital Bern)

Project Team at HuCE

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