Friedrich-Alexander-Universität
Department Artificial Intelligence
in Biomedical Engineering | AIBE

BACHELOR'S/MASTER'S THESIS/RESEARCH INTERNSHIP:

SMARTWATCH-BASED CARDIAC MONITORING: EVALUATING THE PERFORMANCE OF ECG SEGMENTATION ALGORITHMS

Background:

The integration of wearable technology into healthcare has seen significant advancement in recent years, with smartwatches equipped with electrocardiogram (ECG) functionality being at the forefront of this trend. These devices have the potential to revolutionize the management of cardiac diseases, such as heart failure, by enabling continuous monitoring in an ambulant setting.
However, the interpretation of ECG data collected by these devices is a complex task that requires proper segmentation of the ECG signal into its components (e.g. P-wave and T-wave). Although there are several open-source ECG segmentation algorithms available, their performance on smartwatch ECG data has not been thoroughly evaluated. Therefore, this research project aims to evaluate the performance of open-source ECG segmentation algorithms on ECG data collected from smartwatches as well as Holter devices for both heart failure patients and healthy individuals.

Tasks:

- Literature review on ECG segmentation algorithms
- Implement and benchmark existing ECG segmentation algorithms on smartwatches and Holter-ECG data from heart failure patients and healthy individuals
- Write thesis

Requirements:

- Basics in biomedical signal processing (ideally attended BioSig lecture)
- Strong interest in mobile health topics and wearable devices

Please send your CV, your transcript of records and 2-3 sentences about your motivation to:

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