Author: Erik Schreiber

Technical and functional evaluation of EDA-sensors in various fields of application

Type	Bachelor- or Master Thesis
Workingstitle	Technical and functional evaluation of EDA-sensors in various fields of application

Electrodermal activity (EDA) refers to changes in the electrical resistance of the skin, which are influenced by the activity of the sweat glands. These changes mainly occur in response to emotional or physiological arousal, as the autonomic nervous system -particularly the sympathetic nervous system - controls sweat production. EDA is often used to objectively measure emotional states such as stress, anxiety or excitement. Applications can be found in psychological research, in stress diagnostics, in the field of human-computer interaction and in the development of wearables for health and performance monitoring.

As part of this work, various sensors/wearables for EDA measurement are to be compared with each other and evaluated with regard to their suitability for specific use cases (recording stress, physical activity, pain, etc.), recording locations (clinic, at home, on the move) and their respective performance (accuracy, reliability, robustness, etc.). For this purpose, a system for data aggregation with corresponding interfaces will be implemented and smaller explorative studies will be carried out to evaluate the various sensors accordingly.

Tasks

- Design and implementation of software for the aggregation (and comparison) of sensor measured values
- Implementation of the necessary interfaces for connecting the sensors (e.g. reading out sensor values via Bluetooth)
- Design, implementation and evaluation of exploratory tests, possibly with test subjects

Requirements

- Technical studies in e.g. (medical) computer science, physics, biomedical engineering, etc.
- Good programming skills in Java, Python, JavaScript (React, NextJS, etc.) or PHP
- Independence, reliability, ability to work in a team

contact

University of Leipzig
Innovation Center Computer Assisted Surgery (ICCAS)
Erik Schreiber
E-Mail: erik.schreiber@medizin.uni-leipzig.de
Web: www.iccas.de