

Master's Thesis

Laboratory for Biomedical Microtechnology – Prof. Dr.-Ing. Thomas Stieglitz

Topic: In-vitro Validation of Ultrasound Sensor Systems for Vascular Age Monitoring

Introduction

Vascular age represents the biological age of blood vessels, indicating cardiovascular risk. Determining vascular age involves assessing vascular stiffening through biomarkers like tunica media thickness, augmentation index (AI), and pulse wave velocity (PWV). Ultrasound sensors offer a cost-effective and non-invasive means to monitor these biomarkers continuously and comfortably at various vascular sites. However, robust validation methods for new wearable systems are lacking. This project proposes to develop methods, models, and experiments to validate prototype devices in-vitro before progressing to clinical trials.

Objectives

Development of an in-vitro setup for ultrasound sensor systems, focusing on PWV calculation using ultrasound technology.

Your tasks

- Validation of our costumed-made ultrasound sensor with a commercial arm phantom.
- Modelling of several health conditions with the commercial arm phantom.
- Development of a method to monitor the PWV based on two channels ultrasound.
- Development of mathematical models to predict the vascular age.
- Writing the thesis.

Your profile

- You are interested in the field of biomedical engineering, specifically cardiovascular health.
- You enjoy working in the lab, as well as programming.
- You have experience with MATLAB (for data acquisition, data visualization).
- You can work in a concentrated, focused and structured way.

Logistics

- Location: Campus for Intelligent Machine-Brain Interfacing Technology (IMBIT)
- Earliest starting date: October 2023 (can be discussed)
- Maximum length of the thesis: 6 months

Contact

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