

Master's Thesis

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

Topic: Photoplethysmography vs. Ultrasound for Blood Pressure Estimation: An In-Silico Study

Introduction

Various methodologies are available for the estimation of blood pressure (BP). Among these, photoplethysmography (PPG) stands out as a widely used non-invasive and cuffless method. However, ultrasound offers distinct advantages, such as multi-site application capabilities and deeper penetration into tissues. It is important to investigate whether ultrasound also exhibits higher estimation accuracy compared to PPG. Therefore, a novel in-silico study comparing both methodologies is warranted to gain deeper insights into their performance.

Objectives

Utilization of synthetic datasets with physiological parameters and corresponding blood pressure values to simulate applying PPG and ultrasound techniques for BP estimation.

Your tasks

- Review of methodologies for BP estimation (state-of-the-art approaches and advancements in the field).
- Apply PPG-based BP estimation algorithm to pulse wave datasets.
- Compare performance with ultrasound.
- Writing the thesis.

Your profile

- You are interested in the field of biomedical engineering, specifically cardiovascular health.
- You are comfortable with programming in MATLAB (but not exclusively).
- You enjoy researching new methodologies.
- 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

M.Sc. Carolina Seabra
 Laboratory for Biomedical Microtechnology
 Department of Microsystems Engineering (IMTEK)
 IMBIT // NeuroProbes
 University of Freiburg

Georges-Koehler-Allee 201 (Room 01.027)
 E-Mail: carolina.seabra@imtek.uni-freiburg.de
 URL: www.imtek.de/bmt

