Date: 13.11.2024

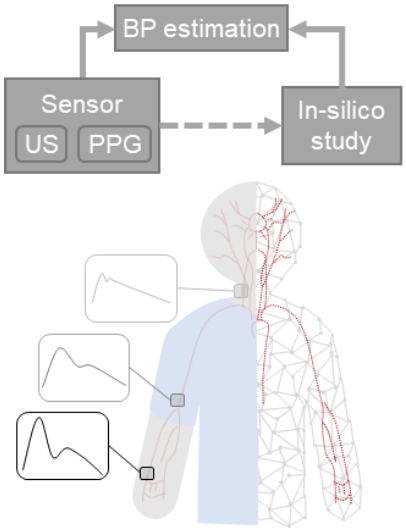
Student Project

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

Preliminary Study on Photoplethysmography *combined with/vs* Ultrasound for Blood Pressure Estimation

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 study comparing both methodologies is warranted to gain deeper insights into their performance.



Objectives

Utilization of 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).
- Research available databases incorporating both US and PPG waveforms.
- Apply PPG-based BP estimation algorithm to pulse wave datasets.
- Presenting results, discussing progress and next steps.

Your profile

- You are comfortable with programming in MATLAB and/or python.
- 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: January 2025 (can be discussed)
- Max. length of the project: 3 months

Contact

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