



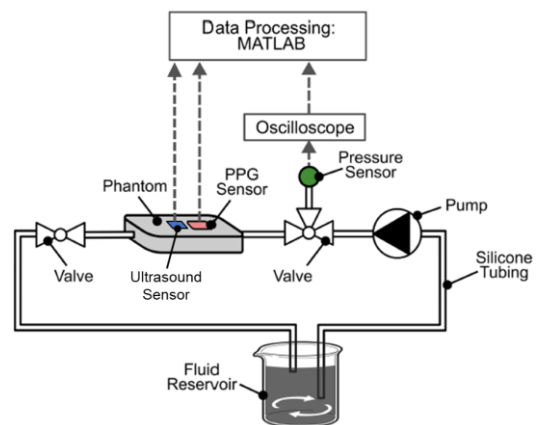
Master's Thesis

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

Photoplethysmography *combined with/vs* Ultrasound for Cardiovascular Health Monitoring

Introduction

Various methodologies are available for the estimation of blood pressure and cardiovascular health monitoring. Among these, photoplethysmography (PPG) stands out as a widely used non-invasive and low-cost 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 and/or combining both methodologies is warranted to gain deeper insights into their performance.



Objectives

Comparing and combining a PPG sensor with ultrasound and validate it in a custom-made cardiovascular phantom.

Your tasks

- Review of methodologies for cardiovascular health monitoring (state-of-the-art approaches and advancements in the field).
- Estimate cardiovascular health indicators from pulse wave datasets.
- In vitro study: combine both sensors into a master system and validate it in a custom-made cardiovascular phantom.
- Presenting results, discussing progress and next steps.
- Writing the thesis.

Your profile

- You are comfortable with programming in MATLAB and/or Python.
- You enjoy researching new methods.
- You can work in a concentrated, focused and structured way.
- You can work independently.

Logistics

- Location: Campus for Intelligent Machine-Brain Interfacing Technology (IMBIT)
- Earliest starting date: January 2025 (can be discussed)
- Maximum length of the thesis: 6 months

Contact

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