UMC Utrecht

PrecorDx

Thesis/internship assignment

Interstitial tissue fluid measurement by RF impedance

Location: Utrecht Science Park (in-person / hybrid)
Company: UMC Utrecht and PrecorDx
Start date: As soon as possible (flexible)
Duration: ~ 6 months

Objectives

Cardiovascular disease (CVD) remains the leading cause of death worldwide. Early identification of declining cardiac function in cardiovascular patients is pivotal to tailoring medical therapy and slowing disease progression.

PrecorDx and UMC Utrecht developed a promising new measurement technique called radio-frequency sensing (RFS), which uses compact, on-body RF antennas to track cardiac activity (see Fig. 1). This technology allows for non-invasive measuring and monitoring advanced biomarkers outside hospital settings such as the home.

Interstitial tissue fluid, i.e. fluid content surrounding cells, is an important factor in the health and progression of heart failure patients. Such fluid affects the impedance of the body. In this project we will explore the use of RF sensing to measure body impedance, to detect, classify and quantify interstitial tissue fluid.

Responsibilities

- Perform a literature study
- Developing a quantitative framework for impedance measurement / calibration, in close collaboration with the research team
- Setting up bench experiments to validate the framework
- Implementing (calibration) algorithms using Python or MATLAB

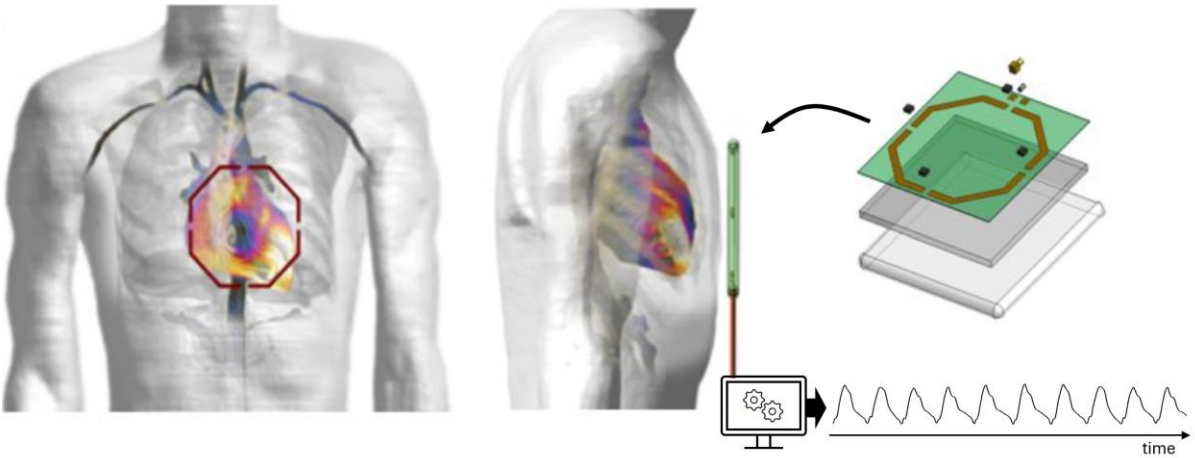

Fig. 1: Setup and sensitivity map of PrecorDx's RF antenna that measures cardiac motion.

Your profile

- Educational Background: MSc candidate in Electrical Engineering, Biomedical Engineering, Applied Physics, or Technical Medicine with a keen interest in physics
- Experience & Skills: (bench) experiments, Python and/or MATLAB, (complex) signal processing, RF know-how is preferred
- Mindset: Highly analytical, keen interest in biomedical applications, creative, independent, team player

What We Offer

- **Expert Guidance:** Direct mentorship and coaching from experienced UMCU researchers and the PrecorDx team.
- **Vibrant Environment:** A dedicated workspace at the Utrecht Science Park, with one foot in academia, and one in a startup setting.
- **Impact:** The unique opportunity to contribute to a breakthrough medical device that will directly improve the lives of heart failure patients.

About Us

UMC Utrecht and PrecorDx (med tech startup) are on a mission to transform cardiology by developing a new class of diagnostic and monitoring solutions that will change the lives of millions of heart failure patients. We work with physicists, clinicians, hardware and software specialists to develop this technology into practical clinical applications.

If you thrive in a fast-paced, innovative environment at the intersection of research and novel technologies, and want to make a real impact on healthcare, we'd love to meet you.

Interested? If you're ready to make an impact on cardiovascular healthcare, we'd love to hear from you! Please send your resume and a short motivation to iris.huijben@precordx.com, and we'll get back to you shortly.