

Health Innovation – Human Life Sign Monitoring

A project in theme Electronics of Internet of Things

– the overarching strategic research program of Halmstad University, supported by The Knowledge Foundation

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Partners:

HMS Industrial Networks AB, NIBE AB, AES AB, Swedish Adrenaline AB, Höganäs Digital Metal, Creative Tools AB, Halmstad University

Background and Motivation

The demography of the population in many countries are becoming very challenging with a rapidly growing portion of elderly. In order to provide health care with good quality at costs acceptable to the society new technologies need to be brought to good use.

In this work we explore the use of microwave technology for monitoring of vital life signs of persons in a room such as:

- Position
- Heart rate
- Respiration

This with no devices on the body and without intrusion of privacy.

Research Problem and Approach

The aim of this work is to detect and monitor respiration and heart rate of several persons in a room using radar. The radars are operating in 2-6 GHz (so called UWB radars) and high frequency radar operating in the 60GHz ISM band.

These radar technologies have different properties and will be compared and evaluated.

These devices require flexible and efficient antenna designs. To meet this requirement additive manufacturing technologies are studied for antenna designs.

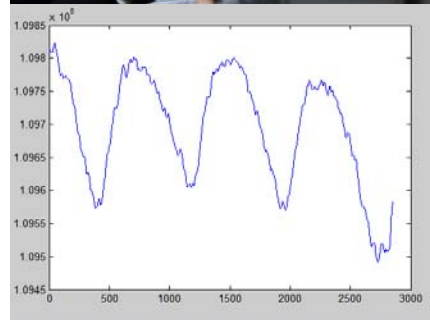
Goals

To develop a radar that meets the requirements in a health care context that detects the important vital life signs in a secure and not intrusive way.

Results so Far

Based on two radar technologies signal processing algorithms are being developed and evaluated. Respiration rate has successfully been detected on 20 subjects in a bed at a range of 1.5 m invariant of the position of the person.

A broadband antenna has been 3D-printed and evaluated.



Publications

T. Taheri, A. Sant'Anna, Non-invasive breathing rate detection using a very low power ultra-wide-band radar. *2014 International Workshop on Biomedical and Health Informatics (BHI 2014)*.

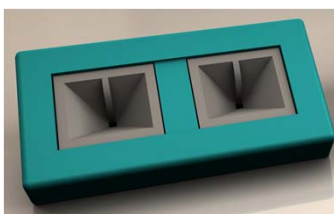
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