

MakesSense! – Sensor Collaboration in Welfare Technology

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The Makes Sense! project *aims at*

- forming a strong multidisciplinary research team and
- starting a long-term collaboration between MIUN (Sundsvall, Sweden) and SAMK (Pori, Finland) in the field of welfare technology research.

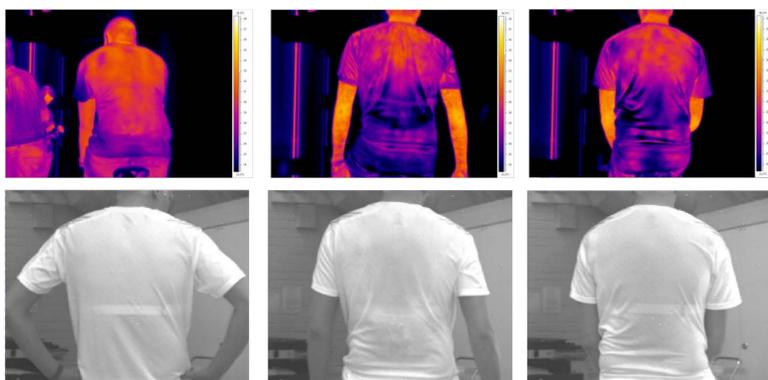
The ultimate *goal* for this collaboration is

- to increase well-being and
- provide solutions for meeting the challenges caused by demographic changes and population's inactivity problems both in Finland and Sweden, as well as...
- generate and share expertise and new business opportunities.

Sensor Technology

Development of wireless sensing systems based on **NFC/RFID and NIR/IR technologies** for **measuring physical indicators**, as perspiration, in order to provide data about effectivity and safety in physical exercise.

The sensor platform and the readings should subsequently be further developed for several other applications like: temperature, perspiration analysis and various smart building applications.



Sensing perspiration - Sweat in cloths and on skin during exercise

Wearable sensor material

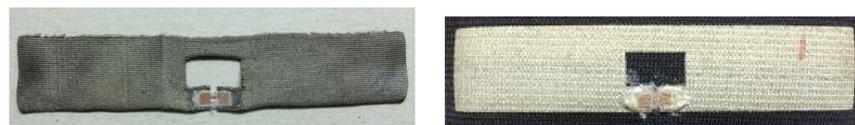
One part of the project evaluates different material as **wearable sensor substrates**. Evaluated properties include printability with functional inks, absorption of liquids to be characterised and wearability in terms of comforts.



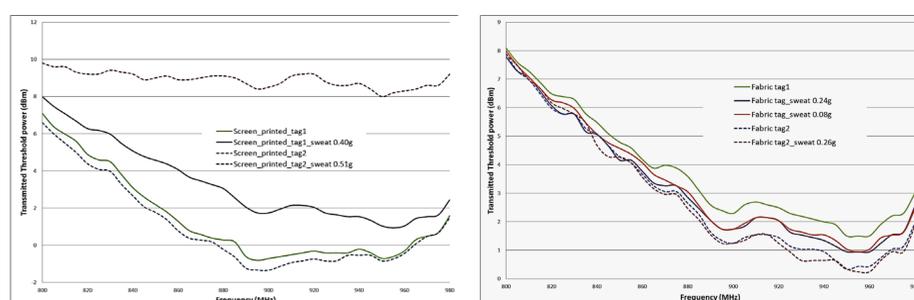
Examples of evaluated material. Fabrics and hospital sheet absorbed liquid the best. Bandages and artificial skin did not absorb anything in 3 min time but resistance change could still be measured. Sugar water was absorbed more rapidly compared with plain water and salt water

Sensing perspiration with RFID tags

Evaluation of how **UHF RFID tags** on fabrics with antennas fabricated from respectively conductive ink and conductive fabrics are affected by sweat absorbed into the tag antennas.



Tag antennas manufactured from silver plated stretchable fabric made of nylon (76%) and elastic fibers (24%) (left) and by screen printing polymer thick film (PTF) silver ink on stretchable fabric substrate (right).



Measured transmitted threshold power of above fabric tags when dry and when real human sweat has been applied.

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