

FUTURE-FORWARD TECHNOLOGY DEMOS

Artificial Intelligence, big data, bio-sensors and digital technology hold the potential to advance well-being in unexpected ways. Using innovative technology to provide foundations for good life requires bold visions and beyond the obvious thinking. Here are a few examples from us:

Assistive device for the visually-impaired based on unique radar technology

Guidesense enables the visually impaired to perceive their environment more accurately and safely. The radar senses obstacles surrounding the user, and vibrates or gives voice feedback to convey information back to the user.

The prototype device has been clinically tested by 25 visually impaired test users in trials approved by the National Supervisory Authority for Welfare and Health (Valvira). Trial partners included Kuopio University Hospital and the Finnish Federation of the Visually Impaired (FFVI).

www.guidesense.com

Long-term ECG-monitoring solution for atrial fibrillation screening

Vital Signum, a VTT spin-off, is developing a small mobile device to detect arrhythmia by measuring the patient's ECG. The device will be suitable for preoperative and postoperative monitoring of cardiac patients at home. The Beat2Phone Sensor digitally transmits the wearer's ECG curve to the screen of a mobile phone in real-time. The data can also be automatically transferred to nursing staff via a cloud service.

www.beat2phone.com/en

Elastic wireless sensor platform for health care and well-being applications

VTT Flex Node and Stretch Node are ultra-thin and lightweight, even stretchable, sensors. These unique characteristics contribute to unprecedented comfort and enable unobtrusive use, such as skin contact patches and integration into clothing.

The sensing options include sophisticated inertial measurements, ambient or local body parameters as well as multiple bio-signal measurements. The sensor features include the possibility for a fully wireless and sealed implementation, where both the communication and re-charging is arranged wirelessly.

Medical diagnostics based on exhaled carbon dioxide

Due to non-invasiveness and painless sampling, breath analysis is a growing trend in clinical diagnostics. We have developed a CO₂ isotope breath analyser, which has the potential for significant business impact.

Stable isotopes are potential markers for prediabetes and type-2 diabetes, sepsis early detection, drug efficacy testing, and numerous other medical diagnostics. We will be demonstrating live measurement of three main isotopologues of exhaled CO₂: main isotopologue, ¹³C, and ¹⁸O.

Automatic stress-monitoring system

Stress-free environment has a positive impact on well-being. To avoid stress, it is important to identify and conclude personal interpretation of stress factors and causes of mental strain.

We are developing a real-time artificial intelligence-based load-detection solution that identifies and analyses sources of stress by utilising information collected by smart phones, devices and the environment. Our mobile and cloud computing algorithm simulates behaviour, identifies stress and provides feedback which can eventually guide or control activity.