VTT – your research, development and innovation partner

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VTT in numbers

296 M€ operating income	**2,390** employees	**457** patent families
49 % of the net turnover from abroad	**1,100** customers	**598** scientific articles

We create solutions in three business areas

We help our clients and partners build new businesses and find sustainable solutions to global challenges through science and technology.

Our mission is to promote the application and commercialization of research and technology in business and society.

Carbon neutral solutions

Digital technologies

Sustainable products and materials

Digital technologies

We create cutting-edge digital technologies and identify future opportunities to solve global challenges

Scaling up quantum

Specialised microelectronics

Integrated flexible electronics

Personalised health and wellness

Photonics sensing

Secured connectivity

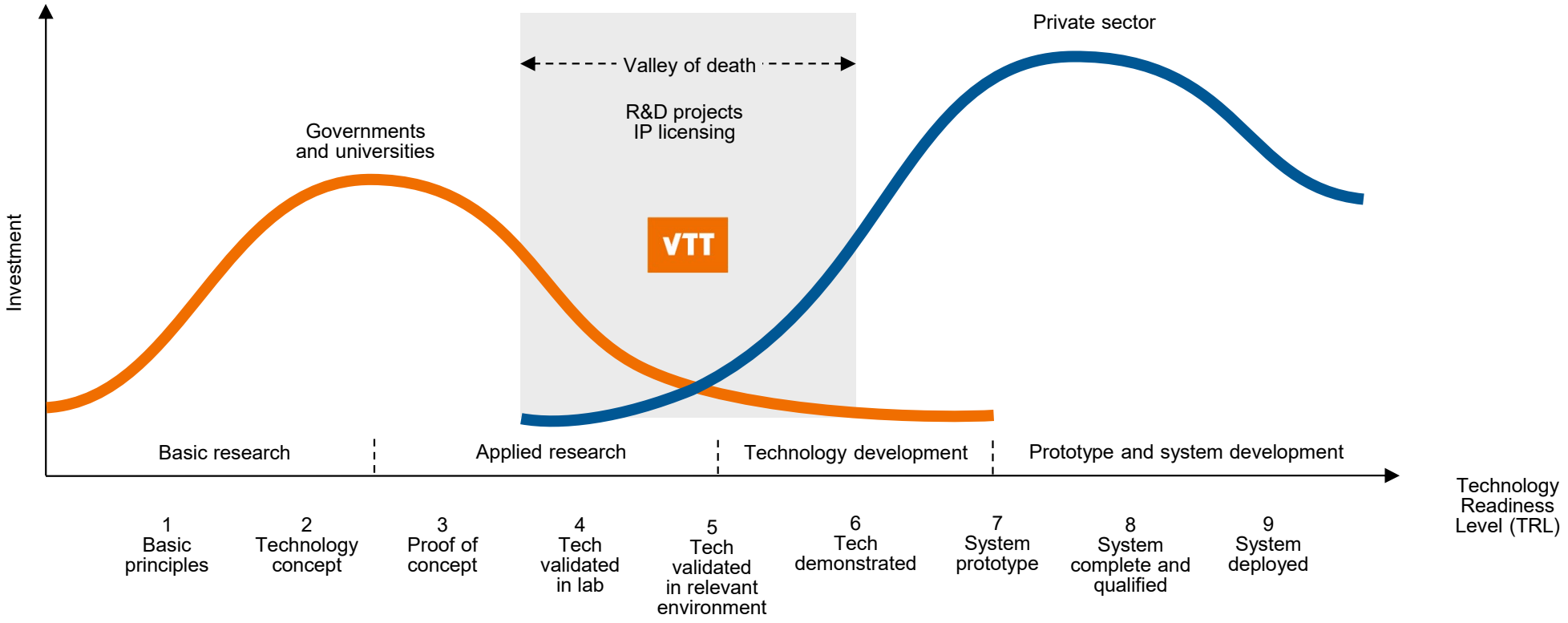
New space

Defence & security

We innovate tomorrow's solutions together with our customers and partners

We enable the development of a high-performing and sustainable digital society

We help our customers turn science into practical innovations



VTT Pilot Lines & Research

Scaling Up New Technologies
VTT pilot lines help move innovations from the laboratory to industrial scale, making large-scale production possible.

Real-World Testing & Commercialization
These pilot lines enable practical testing, minimize risks, and speed up the process of bringing new products to market.

Innovation-Focused Research Infrastructure
VTT's infrastructure offers state-of-the-art facilities, expert teams, and collaboration with industry and academic partners.

https://www.vttresearch.com/en/technology-infrastructures

How to work with VTT?

- VTT offers R&D services for design, prototyping and verification of new concepts and solutions and support for technology transfer for commercial production

- Cooperation models:
  - Contract research projects exclusively tailored to the needs of the customer
  - Exclusive and non-exclusive licensing of VTT's technologies
  - Networked co-operation in publicly funded projects

Cooperation with us promotes sustainable renewal of trade and industry

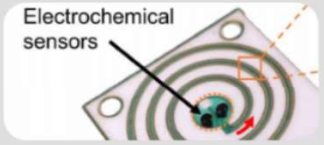
Health Technologies

VTT Health: Towards Personalized and Holistic Healthcare

CONTINUOUS REAL-TIME HEALTH MONITORING

Vital signs
- ECG
- PPG
- Blood pressure
- O_2 Saturation
- Respiratory rate
- Blood flow

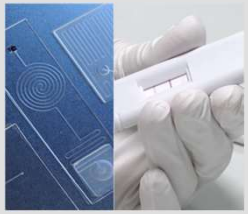
Metabolism
- Lactate, Glucose
- Electrolytes

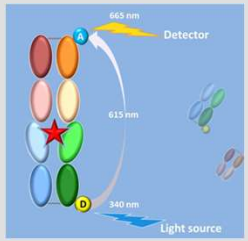


Digital biomarkers
Multiple biosignals, incl.eye movements

Medical-grade health assessment capabilities, expanding clinical monitoring outside hospitals

TARGETED HIGH-SENSITIVE MOLECULAR DIAGNOSTICS





Diagnostic platforms and photonics readers.
Novel antibodies to detect:
- Hormonal balance
- Infections
- Cancer

AI models for health assessment and decision assistance

MULTIMODAL DATA INTEGRATION & AI

Trustworthy health twin
- Edge AI
- Federated data analyses

AI-assisted signal processing

COMPLEMENTARY HEALTH DATA

- Exposome
- Genome
- Medical history

Health tech offering

- Novel sensors and diagnostic technologies
  - Sensor components
  - Wearable sensors
  - Non-contact sensors
  - Diagnostic devices, antibodies and reader devices
  - ASIC and system design, prototyping
- Algorithms for medical devices based on sensor and imaging data, registry and biobank data
- Novel digital biomarkers for patient state quantification
- Prediction models and clinical decision support tools
- Sensor and digital biomarker validation in lab and field

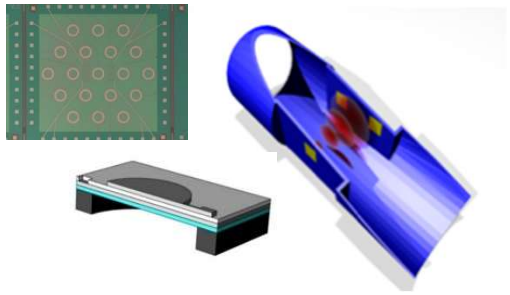
Medical microelectronics

- Microelectronic processes, devices and solutions:
  - Miniaturized sensors and system integration for physiological and biosensing

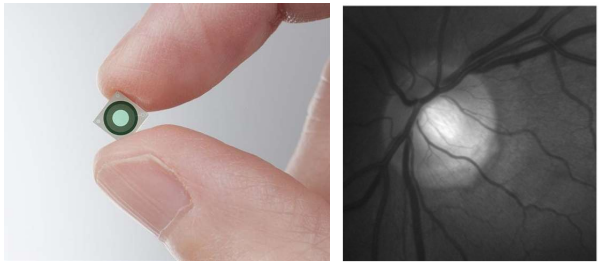
- Application areas:
  - Ultrasonic transducers: gas and liquid flow measurement, medical imaging
  - Hyperspectral imaging for diagnostics, e.g. skin cancer, fundus imaging, drug authentication, and endoscopy
  - Silicon photonics integrated circuits and modules for non-invasive health sensing
  - 2D materials and acoustic resonators for biomolecule sensing

https://www.vttresearch.com/en/ourservices/medical-microelectronics

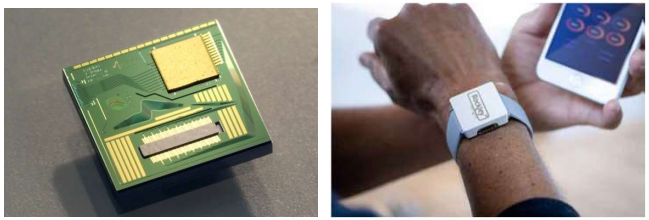
Miniaturized, low-power ultrasonic transducers



Hyperspectral imaging and light sources



Photonic integrated circuits for health monitoring



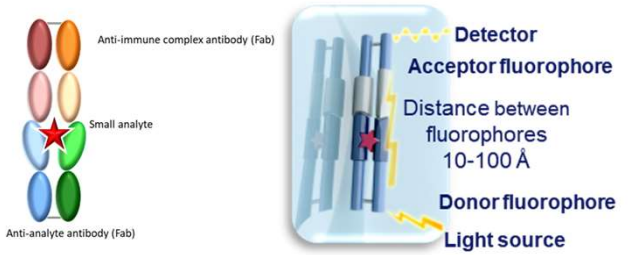
Point-of-care diagnostics

- Technologies for point-of-care diagnostics:
  - Tailored recombinant antibodies
  - Assay development
  - Microfluidics and body fluid sampling
  - Optics, photonics, electrochemistry
  - Custom instrumentation and reader development

- Applications:
  - Diagnostics: hormones, drugs, toxins
  - Therapeutic: cancer and stem cells, allergens
  - Food safety: food allergens, toxins
  - Security and defense: drugs of abuse, biothreats

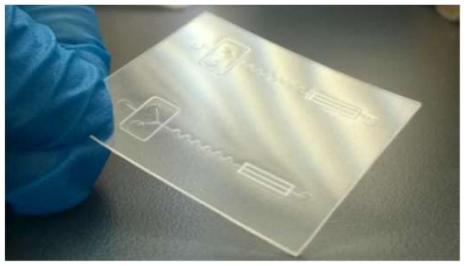
https://www.vttresearch.com/en/ourservices/diagnostic-technologies

FRET assay for small analytes

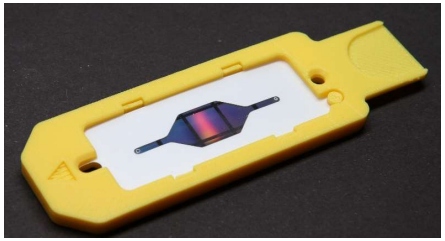


Lateral flow immunoassay

Microfluidic droplet generators



Surface-enhanced Raman spectroscopy in cancer diagnostics



Water toxin test

Mobile diagnostic reader

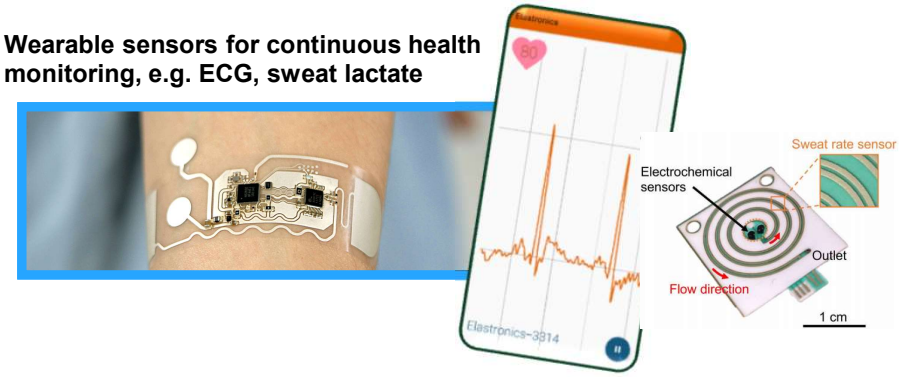
Sensors for health monitoring

- Wearable and non-contact sensing technologies for monitoring vital signs, biochemical markers and behavioural patterns

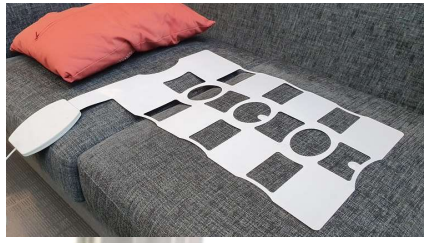
- Examples:
  - Printed, flexible and stretchable sensors for ECG monitoring and sweat sensing
  - Photonics-based medical devices
  - Pressure-sensitive foil sensor and 60GH FMCW radar for monitoring heart rate, HRV, breathing rate and sleep

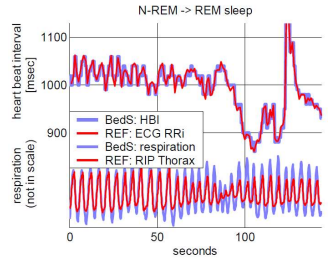
https://www.vttresearch.com/en/ourservices/wearable-electronics-solutions

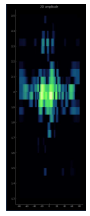
Wearable sensors for continuous health monitoring, e.g. ECG, sweat lactate

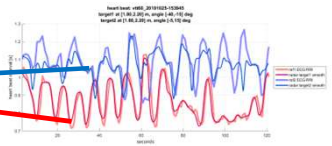


Non-contact sensors, e.g. sleep staging, HR, breathing









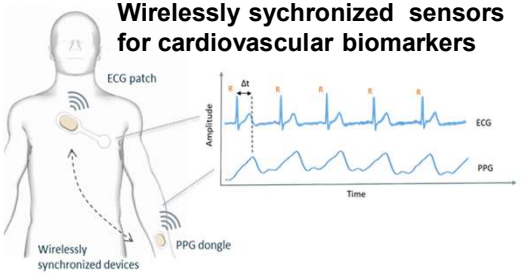
Sensor fusion and digital biomarkers

- Design and validation of solutions for multimodal human sensing:
  - Multisensor data fusion
  - Objective and subjective data collection with secure pipelines
  - AI/ML based analytics
  - Facilities and instruments for laboratory and field validation studies

- Applications:
  - Cognitive state estimation, e.g. acute stress, vigilance, fatigue
  - Sleep analyses, e.g. sleep staging and recovery, apnea detection
  - Cardiovascular monitoring, e.g.pulse arrival time, arrhythmia
  - Activity modelling and context recognition

https://www.vttresearch.com/en/ourservices/human-sensing-solutions

Wirelessly sychronized sensors for cardiovascular biomarkers



Cognitive state estimation based on eye movements and vital signs

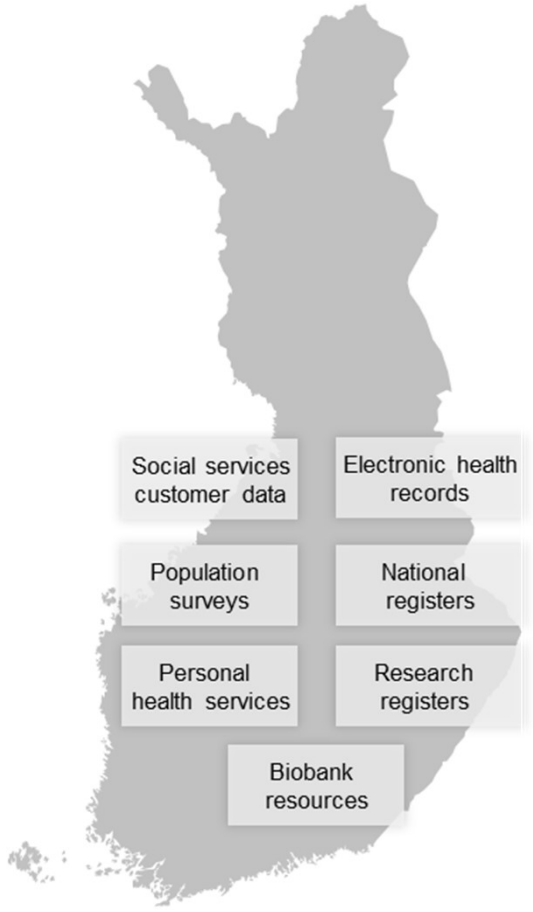
Secure infrastructure for subjective and objective multisensor data collection for clinical trials

AI & High-quality Real-World Data

- VTT leverages multimodal health data and AI to develop novel data-driven health solutions
  - AI/ML model development and validation based on real-world data
  - Medical imaging and video analysis
  - Privacy-enhancing technologies

- Applications:
  - Prediction models for disease risk and health service utilization
  - Precision medicine, e.g. pharmacogenomics
  - Segmentation and target localization in medical images
  - Algorithms for medical devices
  - Synthetic 3D MRI image generation and quality evaluation

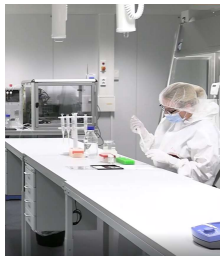
https://www.vttresearch.com/en/ourservices/health-data-analytics



Infrastructures for prototyping and validation

Micronova infrastructure for micro and nanotechnology development

- The largest R&D cleanroom in the Nordic countries
- Pilot lines for semiconducting, integrated photonics, graphene and superconducting technologies
- Sensor development and characterization



Medical Device Pilot line for photonics based and wearable devices

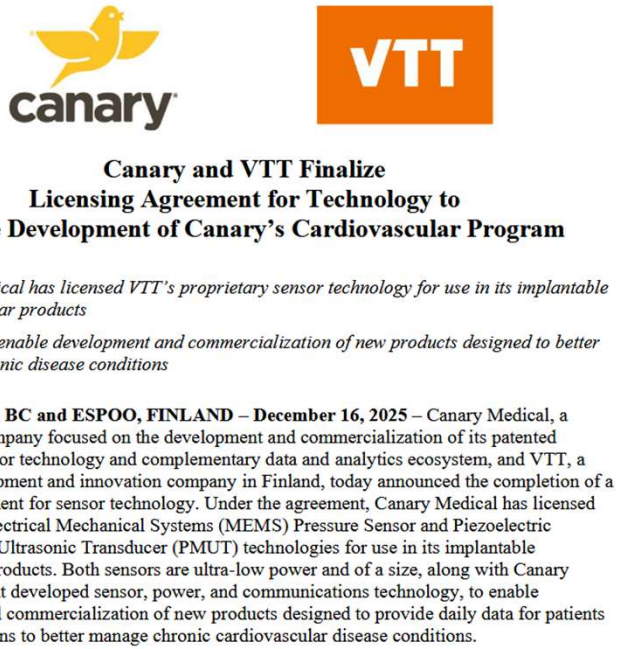
- Clean room with controlled environmental conditions
- QMS enables collaboration with ISO 13485 certified companies
- Roll-to-roll printing, post-processing, hybrid and structural electronics integration and testing
- Pilot production of components, devices, systems and end-user products

Health labs for sensor and digital biomarker validation

- Facilities for physiological measurements including physical and mental provocation
- Pre-commercial sensor validation
- Virtual reality studies
- Measures available: ECG, EEG, PPG, SPO2, GSR, EDA, acceleration, eye movements

Customer references

Miniature sensors for cardiovascular monitoring



Canary and VTT Finalize Licensing Agreement for Technology to Enable Development of Canary's Cardiovascular Program

- *Canary Medical has licensed VTT's proprietary sensor technology for use in its implantable cardiovascular products*
- *Sensors will enable development and commercialization of new products designed to better manage chronic disease conditions*

VANCOUVER, BC and ESPOO, FINLAND – December 16, 2025 – Canary Medical, a medical data company focused on the development and commercialization of its patented implantable sensor technology and complementary data and analytics ecosystem, and VTT, a research, development and innovation company in Finland, today announced the completion of a licensing agreement for sensor technology. Under the agreement, Canary Medical has licensed VTT's Micro Electrical Mechanical Systems (MEMS) Pressure Sensor and Piezoelectric Micromachined Ultrasonic Transducer (PMUT) technologies for use in its implantable cardiovascular products. Both sensors are ultra-low power and of a size, along with Canary Medical's current developed sensor, power, and communications technology, to enable development and commercialization of new products designed to provide daily data for patients and their clinicians to better manage chronic cardiovascular disease conditions.

https://www.vttresearch.com/en/news-and-ideas/canary-medical-and-vtt-finalize-licensing-agreement-technology-further-enable

Licensing from VTT resulted in significant time and cost savings for Wellpro

Wellpro Impact Solutions aimed to create an activation program that would encourage users to cultivate healthy habits through simple daily routines. The company decided to license VTT's BitHabit, a software platform that supports lifestyle modifications and reduces the risks of illness by utilising the habit formation theory and extensive scientific research. Licensing the ready-made solution enabled Wellpro to enter the market swiftly and save hundreds of thousands of euros and at least five years in software development efforts.

Substantial savings in both time and money

Immediate access to a science-based solution that helped ensure swift market entry

Wellpro's BitHabit mobile application currently boasts 30,000 users

> **"We saved at least five years and a substantial amount of money compared to if we had developed the app ourselves. Regardless of our available resources, I don't think we could have created a similar platform."**
>
> **Petteri Sveins,**
> **CEO, Wellpro Impact Solutions**

Cutting-edge Parkinson's disease diagnostics through biosignal processing

VTT collaborated with **Manus Neurodynamica** to create a unique innovation that diagnoses tremors caused by Parkinson's disease. The inventive NeuroMotor Pen records hand movements while writing or drawing, capturing even subtle tremors. This tool relies on VTT's expertise in biomedical signal processing and paves the way for earlier, more accurate and less invasive neurological diagnoses.

Up to 80% accuracy
in identifying Parkinson's tremors

Improved treatment
thanks to earlier and more accurate diagnoses

Potential for diagnostic tools
focused on several neurological diseases

"Our unique analytics have been largely developed by our long-term collaborators at VTT, who have made a very significant contribution to the development of our groundbreaking technology."

Rutger Zietsma
CEO
Manus Neurodynamica Ltd

manus NEURODYNAMICA

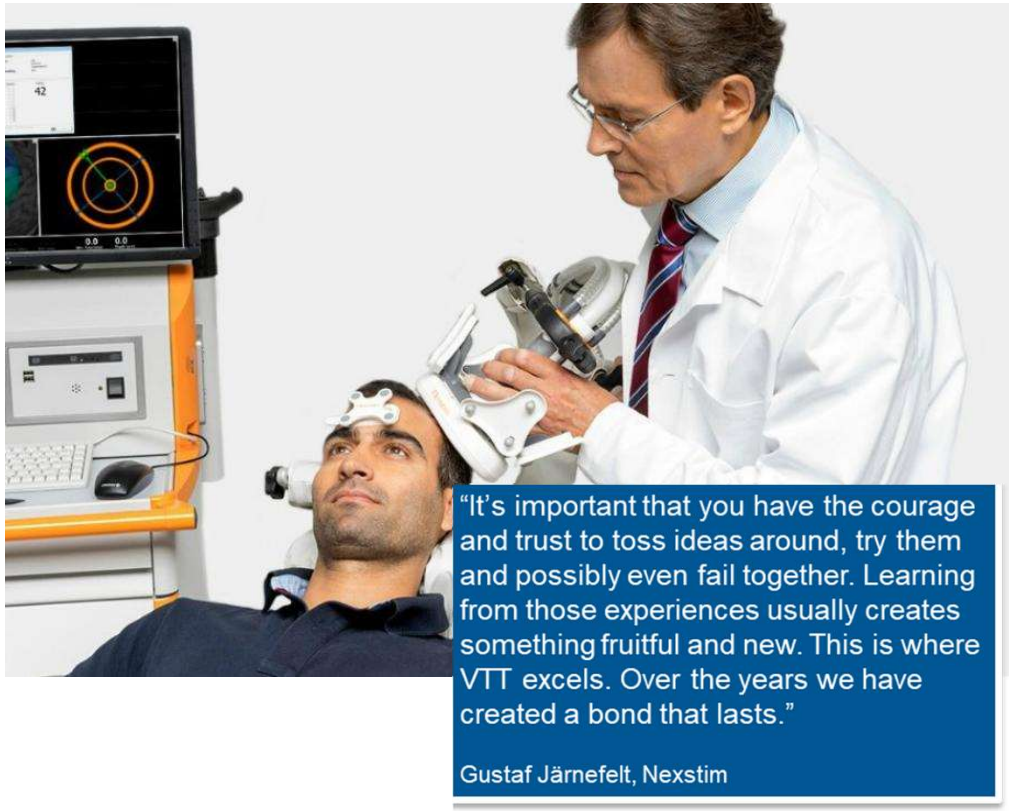
Algorithms for targeted brain stimulation help treatment of depression and chronic pain

The treatment of clinical depression and chronic pain rely heavily on medicines that may cause addiction and undesirable side effects. Together with VTT, **Nexstim** has been developing algorithms that support the medical stimulation of the brain. Treating various medical conditions with targeted brain stimulation instead of medicines is more efficient and has fewer side effects.

Reduces dependence on medicines

Enables targeted and effective medical treatment

Improves locating and visualising brain anatomy and target areas



Faster recovery and increased patient safety with wearable technology

GE Healthcare is creating next-generation wearable sensors to support patient recovery and give healthcare professionals new possibilities to monitor patients remotely. GE Healthcare chose VTT as their strategic partner because of VTT's technology excellence and existing printable electronics infrastructure.

Wearable, wireless innovations help patients to move independently after surgeries

Remote monitoring increases patient safety after they are discharged

Earlier discharge frees space in hospitals

"We work with several science institutions globally and VTT's reputation as a highly competent organisation is well-known everywhere."

Erno Muuranto
Managing and Engineering Director
GE Healthcare

Commercial products based on VTT bed sensor

- Finnish startup eLive Ecosystem first to commercialize VTT's solution for sleep monitoring and sleep apnea diagnostics

- In partnership between eLive and VTT, the sensor technology is adapted by a US-based company Sleep.me Inc
  - Sleep.me products received a CES honoree innovation award in 2022

VTT

beyond

the obvious

Thank you!

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