

NORDIC CONFERENCE ON  
**Digital Health and  
Wireless Solutions**

**From Diverse Data to Better Health**

---

**Nordic Conference  
on Digital Health and  
Wireless Solutions**

---

**Kontinkangas Campus, University of Oulu  
June 16-17, 2026**

# Table of Contents

---

Welcome Words .....	3
Program at a Glance.....	4
Conference Venue.....	6
Speakers.....	8
Detailed Program.....	14
Conference Proceedings .....	29
Committees.....	31
Exhibitors.....	32
6GESS – 6G Enabling Sustainable Society.....	40
Fibrobesity – Preventing Fibrosis Related to Obesity .....	42
Health Dimensions – Exploring the Complex Multidimensional Nature of Human Health ...	44
Oulu Brain & Mind .....	46

**Disclaimer:**

the organisers keep the right to change the program without a prior notice. Please check the latest program version on the conference website.

# Welcome Words

---

Digital transformation is reshaping healthcare tools, organizations, and operating models. The concept of digital health encompasses previously defined electronic healthcare services, such as telemedicine or eHealth, augmented with advanced data processing and computing methods like artificial intelligence. Broadly, digital health methods are believed to bring modern healthcare services to areas where they were previously unavailable. Similarly, more precise diagnostics and treatments using the collected digital health data are expected. Additionally, advancements in monitoring healthcare quality and effectiveness are anticipated, along with progress in research and education through better secondary use of health information. The emergence of wireless 5G and 6G technologies has brought healthcare services to users' mobile devices, allowing citizens to participate in their healthcare in unprecedented ways.

This second Nordic Conference on Digital Health and Wireless Solutions (NCDHWS2026) is organized by University of Oulu research programs Digital Health and 6G Enabled Sustainable Solutions, in collaboration with Fibrobesity, Health Dimensions, and Oulu Brain & Mind research programs. It is supported by local partners Oulu University Hospital, The Wellbeing Services County of North Ostrobothnia, Oulu University of Applied Sciences, and Business Oulu. The idea is to bring together multidisciplinary research activities in medical and health sciences, health economics, information, and sensor technology, as well as in artificial intelligence and wireless communications. This international conference provides an excellent opportunity for professionals, researchers, and industry leaders from different fields to share insights on the latest developments on digital health and related technology.

We are delighted to have outstanding Keynote and Invited speakers from around the world to give us inspiring talks on their research topics, covering a wide range of multidisciplinary themes. Short descriptions of the talks are given in the following pages. We also have excellent scientific oral presentations divided into different thematic sessions, as shown in this program booklet. Some of the scientific presentations are presented as posters which are listed at the end of the detailed program.

So, warmly welcome to NCDHWS2026! We sincerely hope you enjoy this unique multidisciplinary conference!

On behalf of the NCDHWS2026 conference organizers



**Jarmo Reponen**  
Conference President



**Mariella Särestöniemi**  
Scientific Committee Chairperson

# Program at a Glance: Tuesday 16<sup>th</sup> June

Time	Tuesday 16.6.2026
08:30 09:30	Registration
09:30 10:30	<b>Session 1 Plenary: Digital Transformation in Healthcare</b> Opening words: Jarmo Reponen; Government greetings: Minister Mari-Leena Talvitie; Keynote: Joan Guanyabens
	Coffee, Exhibitions and Posters
11:00 12:30	<b>Session 2a: Digital Health Transformation, Innovations &amp; Future Visions</b> Invited speeches: Sabine Koch & Rune Pedersen
	<b>Session 2b: Personalised Digital Health – From Omics to Interventions, Telemedicine and eRehabilitation</b> Invited speeches: Gudrun Audur Hardardottir & Ville-Petteri Mäkinen
	<b>Session 2c: Data-Driven and Modelling-Based Decision Support &amp; Multimodal Health Data Analysis I</b> Invited speech: Karim Lekadir
	<b>Session 2d: Connectivity Architectures and Cybersecurity in Digital Health</b> Invited speech: Aaron Ding
	Lunch, Exhibitions and Posters
14:00 15:30	<b>Session 3a: Next-Generation Wireless Health Technologies, Wearable Sensing, and Digital Twin Innovations</b> Invited speech: Sandra Dudley
	<b>Session 3b: Health Technology Assessment &amp; Impact Evaluation</b> Invited speeches: Emmanouil Tsiasiotis & Vivian Vimarlund
	<b>Session 3c: Education in Digital Health I</b> Invited speech: Maryam Alimardani
	Coffee, Exhibitions and Posters
16:00 17:30	<b>Session 4a: AI and LLMs in Healthcare: Tools for Professionals, Support for Citizens I</b> Invited speech: Mourad Oussalah
	<b>Session 4b: User Experience, Acceptance &amp; Adoption of Health Information Systems</b> Invited speeches: Christian Nøhr & Jeppe Eriksen
	<b>Session 4c: Wearable Sensors, Antennas and Physiological Measurement Systems</b> Invited speech: Oliver Amft
19:30	<b>Gala dinner at Restaurant Toivo of Radisson Blu Hotel</b> For those who have booked the dinner at the time of conference registration

# Program at a Glance: Wednesday 17<sup>th</sup> June

Time Wednesday 17.6.2026

08:00 Bus transportation from hotels to site visits  
08:30

08:30 Site Visits  
10:30 Bus transportation from site visits to Kontinkangas campus

Coffee, Exhibitions and Posters

11:00 **Session 5a: AI and LLMs in Healthcare: Tools for Professionals, Support for Citizens II**  
12:30 Invited speech: Lucie Flek

**Session 5b: Data-Driven and Modelling-Based Decision Support & Multimodal Health Data Analysis II**  
Invited speech: Arild Faxvaag

**Session 5c: Education in Digital Health II**  
Invited speech: Gillian Vesty

Lunch, Exhibitions and Posters

14:00 **Closing Plenary: Future of Digital Health**  
15:30 Keynote: Smisha Agarwal; Invited Speeches: Shao-Jen Weng & Pasi Eskola; Closing words: Simo Saarakkala

## Practical Information

**Sessions** are located in different rooms as follows:

- Sessions A: 101A (Leena Palotie Hall)
- Sessions B: F202
- Sessions C: H1091
- Session D: 338B

**Lunch and coffee** will be served to conference participants every day. Coffee will be served in the Exhibition area.

**Gala dinner** will be served on Tuesday, June 16<sup>th</sup> at 19:30 in restaurant Toivo of Radisson Blu Hotel for those who have it included in the ticket price.



The detailed program is presented in this booklet, starting from page 14. Any updates or changes will be informed in the conference webpage which can be accessed with the QR code on the left.



# Conference Venue

---

The conference venue is located at the **Kontinkangas campus**, Aapistie 5 A, 90220, Oulu. The campus is a short walking and cycling distance (about 3,5 km), from the centre of Oulu.



## Locate yourself with an App

---

With the **MazeMap mobile app**, you can find routes to different spaces on the Kontinkangas campus. You can download MazeMap to your phone from the app store, or use MazeMap browser version. Note that indoor positioning functionality is not available in the browser version.



# Kontinkangas Campus Venue Map





**Speakers**

---



**Joan Guanyabens** is Director of the TIC Salut i Social Foundation, a public organisation driving digital transformation in health and social care in Catalonia. He is also President of the Board of the European Health Telematics Association (EHTEL). A medical doctor from the University of Barcelona with a Master's in Health Management from ESADE, he has held senior leadership roles across the public, academic and private sectors, advancing digital health strategy, innovation and governance.

---



**Sabine Koch** is the Strategic Professor of Health Informatics and Head of the Department of Learning, Informatics, Management and Ethics at Karolinska Institutet, Sweden. Her research interests combine medical informatics and human-computer interaction to design and evaluate services for enhanced decision making and collaborative care. Dr. Koch is previous President of the International Medical Informatics Association (IMIA) and Editor-in-Chief of Methods of Information in Medicine.

---



**Rune Pedersen** is a Professor at the NORD university in Norway and also a senior researcher at the Norwegian Centre for E-health Research in Tromsø, Norway. His research interests seek to the development of holistic clinical patient journeys by using heterogeneous interoperable EPR systems.

---



**Gudrun Hardardottir** is a Special Advisor in the Digital Health Unit at the Ministry of Health in Iceland. Her work focuses on developing and implementing national digital health solutions, including ePrescriptions, the National Citizen Health Portal, and Electronic Health Records. She also coordinates Iceland's National Contact Point for eHealth and EU4Health eHealth services.

---



**Ville-Petteri Mäkinen** is a senior researcher at the Research Unit of Population Health at the University of Oulu, Finland. His research focuses on molecular determinants of chronic diseases, including obesity, diabetes, heart disease, and dementia. A pioneer in NMR metabolomics, he has advanced genomics research at UCLA, Imperial College London, and SAHMRI.



**Karim Lekadir** is an ICREA Research Professor at the Department of Mathematics and Computer Science, University of Barcelona, Spain and Director of the BCN-AIM Lab. His research focuses on trustworthy and ethical AI in healthcare, emphasizing fairness, accessibility, and generalisability. He has led numerous EU-funded projects and authored the FUTURE-AI guideline for deployable healthcare AI.

---



**Aaron Ding** is Director of CPI Lab and Senior Associate Professor with tenure at TU Delft, Netherlands. His research focuses on interconnected Edge AI systems, supported by major EU grants. Previously affiliated with TU Munich, Cambridge, Columbia, and ETH Zürich, he has supervised 100+ students and contributes to leading ACM and IEEE conferences in networking and computing.

---



**Sandra Dudley-McEvoy** is a Professor of Communication Systems at London South Bank University (LSBU) and Director of the REACT Innovation Centre in London, UK. She earned her BSc and PhD in Physics from the University of Essex. Her research focuses on wireless sensing, microwave imaging, and AI-driven healthcare technologies, with applications in non-invasive diagnostics and remote monitoring. She actively leads multidisciplinary collaborations to advance digital health and smart sensing solutions.

---



**Emmanouil Tsiassiotis** is a research associate at the Graduate School of Economics and Health Systems Management at Università Cattolica del Sacro Cuore in Milan, Italy. A civil engineer with a public health degree from the London School of Hygiene & Tropical Medicine, he coordinates international health research projects, including EDiHTA and PHSSR, focused on digital health and health systems resilience.

---



**Vivian Vimarlund** is a Professor Emerita in Informatics at the School of Engineering and Technology, in Linköping University, Sweden. Her research interest combines Informatics and Economics to develop innovative models that capture the value of the implementation of eHealth services. Professor Vimarlund is fellow and auditor of the international Academy of Health sciences.



**Maryam Alimardani** is an Associate Professor at Vrije Universiteit Amsterdam, Netherlands, specializing in Brain-Computer Interfaces (BCI) and Human-Computer Interaction (HCI). Her research combines EEG brain signals and AI to develop adaptive, personalized interfaces for VR, robotics, education, and healthcare, enhancing user interaction and control.

---



**Mourad Oussalah** is a full professor at the Centre for Machine Vision and Signal Analysis at the University of Oulu, Finland, leading the Social Mining Research Group. His research applies NLP and AI to digital health, environmental science, and security, with recent work focusing on LLMs, social media analytics, medical text summarization, digital phenotyping, and decision support.

---



**Christian Nøhr** is a Professor at Aalborg University, Denmark. Professor Nøhr has also been working in the University of Southern Denmark. His research interests seek to health informatics and health care, and he has published a lot of user experience of electronic health record systems. He is the past President of the Nordic eHealth Research Network. He is also the main organizer of the Danish eHealth Observatory -conference.

---



**Jeppe Eriksen** is an Associate Professor in the Department of Sustainability and Planning at Aalborg University, Denmark. His research focuses on health technology, patient-reported outcomes (PROs), and electronic PROs. He studies citizens' experiences with digital health services and is currently Vice President of the Danish Society of Digital Health.

---



**Oliver Amft** is a Professor of Intelligent Embedded Systems at University of Freiburg, Germany, and a Scientific Director of the Hahn-Schickard research centre. He obtained the Ph.D. from ETH Zurich in Electrical Engineering and Information Technology. Oliver held full professorships at several German universities and has been an R&D project manager in industry. He has co-authored over 250 scientific publications on wearable computing, context recognition, biomedical sensor technology, digital health, and embedded systems.



**Lucie Flek** is a full professor at the University of Bonn, Germany, leading the Data Science and Language Technologies group. Her research focuses on NLP, machine learning, AI robustness and safety, spanning LLMs, conversational systems, clinical NLP, mental health, misinformation, and social media. She has held research roles at Amazon Alexa, Google, UPenn, and UCL, and previously contributed to particle physics research at CERN.

---



**Arild Faxvaag** is a professor in Health informatics in NTNU, Trondheim, Norway. His research is centered around understanding how health professionals and patients utilize knowledge to analyse and solve health problems and around using this insight to develop IT-solutions that enables patients, personnel, institutions and governments to realize knowledge-based care in a safe, effective, equal and more sustainable way. Arild Faxvaag is also a senior advisor at Department of medicine and analysis, Helseplattformen A/S.

---



**Gillian Vesty** is a Professor in the College of Business and Law at RMIT University, Australia. She is the Chair of RMIT Education Committee, a member of CPA Australia, Board Member of Games for Change, Asia Pacific, Board Member of Southwest Healthcare, Victoria and on the Editorial Board of *Accounting Auditing and Accountability Journal*. Prof Vesty value-based healthcare research aligns management accounting with healthcare funding and budgeting to address health and wellbeing challenges. Prof Vesty is a keen developer of serious games to simulate real world challenges with social impact.



**Smisha Agarwal** is Director of the Center for Global Digital Health Innovation and Associate Professor at the Johns Hopkins Bloomberg School of Public Health in the USA. She specializes in strengthening primary health care through community health systems and digital innovation. Her work has informed guidance from the World Health Organization, donor investments, and national digital health strategies globally.

---



**Shao-Jen Weng** is Dean of the College of Interdisciplinary Innovation and a tenured Professor at Tunghai University in Taiwan. With 20+ years in Industrial Engineering, he specializes in Healthcare Systems Engineering and Smart Healthcare. He earned a Ph.D. from Arizona State University and leads NSTC-funded projects in simulation optimization and hospital resource management. As founder of the Healthcare Systems Consortium, he promotes engineering-clinical collaboration in smart medicine.

---



**Pasi Eskola** is Chief Medical Information Officer at the Wellbeing Services County of North Ostrobothnia (Pohde) and Assistant Professor of General Practice and Family Medicine at the University of Oulu, Finland. His presentation covers the implementation of the Esko patient information system, lessons learned from large-scale rollout, governance and change management, and how a shared digital platform supports patient safety, continuity of care, multidisciplinary collaboration, and wider healthcare integration and digital transformation.



**Detailed program**

---

## Monday 15.6.2026

18:00-20:00 **Pre-conference event: get-together at the Oulu City Hall**  
· For those who have secured a ticket.

---

## Tuesday 16.6.2026

8:30-9:30 **Registration**

9:30-10:30 **Session 1 –Digital Transformation in Healthcare**

101A (Leena Palotie Hall), Chair: Jarmo Reponen

9:30-9:40 · Conference opening words  
Conference president, Prof. Jarmo Reponen, University of Oulu, Finland

9:40-9:50 · Greetings from the Finnish Ministry of Education and Culture  
Minister of Science and Culture Mari-Leena Talvitie

### **Keynote:**

9:50-10:20 · Catalonia's Digital Health Implementation – New Innovations and Services  
Director Joan Guanyabens, TIC Salut i Social Foundation, Catalunya

10:20-11:00 **Coffee, Exhibitions and Posters**

11:00-12:30 **Session 2a – Digital Health Transformation, Innovations & Future Visions**

101A (Leena Palotie Hall), Chair: Jarmo Reponen

### **Invited Speeches:**

11:00-11:20 · How to design digital health services and sustain their use  
Professor Sabine Koch, Karolinska Institutet, Sweden

11:20-11:40 · A Socio- technical journey: Strategies for implementation and digital transformation, the incremental process  
Professor Rune Pedersen, NORD University, and Norwegian Centre for E-health Research, Norway

### **Scientific Presentations:**

11:40-11:47 · Profiting from 6G System for the Smart Hospital of the Future  
Fan Wang; Seppo Yrjölä; Risto Jurva; Timo Koivumäki; Aigerim Dairabekova; Petri Ahokangas

11:47-11:54 · Identifying Social Sustainability Drivers and Future Scenarios in Digital Healthcare Through a Stakeholder-Based Method  
Sehrish Khan; Petri Ahokangas; Johanna Annunen; Johanna Uusimaa; Jonna Komulainen-Ebrahim; Minna Isomursu

11:54-12:01 · Implementation of the Digital-First Policy in Finnish Well-Being Services Counties: A Cross-Sectional Survey  
Maiju Kyytsönen; Arild Faxvaag; Rune Pedersen; Jeppe Eriksen; Ove Lintvedt; Jarmo Reponen

12:01-12:08 · Electronic Health Record System Market Concentration in Finland, 2007-2028  
Timo Tuovinen; Petra Kuikka; Paula Veikkolainen; Niina Keranen; Virpi Ekholm; Vesa Jormanainen; Jarmo Reponen

12:08-12:15 · Digital Health: From Policy to Reality in the Nordic Countries  
Arild Faxvaag; Jarmo Reponen; Guðrún Auður Harðardóttir; Tuulikki Vehko; Johanna Viitanen; Jeppe Eriksen; Rune Pedersen; Sabine Koch; Vivian Vimarlund; Christian Nöhr

12:15-12:22 · Toward Standardized Evaluation of Synthetic Health Data Across Modalities for the European Health Data Space  
Aino-Lotta Ilona Alahäivälä; Tunc Asuroglu; Juha Pajula; Ileana Montoya Perez; Tapio Pahikkala; Antti Airola

**Exhibitor presentations:**

12:22-12:29 · Digital Health Finland  
12:29-12:36 · Oyster Incubator

11:00-12:30 **Session 2b – Personalised Digital Health – From Omics to Interventions, Telemedicine and eRehabilitation**  
F202, Chair: Eero Kajantie

**Invited Speeches:**

11:00-11:20 · Systemic approach to the development and implementation of national digital health solutions  
Special Advisor Gudrun Audur Hardardottir, Ministry of Health, Iceland

11:20-11:40 · Understanding metabolic ageing and disease risk via omics sciences  
Docent Ville-Petteri Mäkinen, University of Oulu, Finland

**Scientific presentations:**

11:40-11:47 · Dynamic Digital Precision Nutrition for Cardiometabolic Prevention in Cancer Survivorship  
Maryam Gholamalizadeh; Saeid Doaei; Raul Zamora-Ros

11:47-11:54 · Feasibility Evaluation of a Multidisciplinary Digital Rehabilitation Delivered by Community Health Workers for Mild Stroke in Indonesia  
Eeva Aartolahti; Suci Muqodimatul Jannah; Opifia Dian Wahyono; Dela Fariha Fuadi; Andrew Wijaya Saputra; Nesi; Moh Rendy Herdiansyah; Michael Oduor; Kari-Pekka Murtonen; Muhammad Irfan; Katariina Korniloff; Hilmi Zadah Faidullah

11:54-12:01 · Hybrid Teleophthalmology Pilot for Ophthalmologist Appointments  
Anniina Häyrynen; Joonas Wirkkala

21:01-12:08 · A Telemedicine Pathway for Secondary Prevention in Coronary Artery Disease: Real-World implementation  
Outi Haggren, Jari Laukkanen, Anna-Mari Hekkala, Sinikka Yli-Mäyry, Jaakko Immonen, Johanna Keränen, Kari Ylitalo, Kari Kaikkonen

12:08-12:15 · Observations from the Digital Social and Health Care Center (DSHCC) of Wellbeing Services County of North Karelia - Siun Sote, Finland  
Nora Tarvus; Mika Kortelainen; Paulus Torkki; Mikael Ripatti; Marjo-Riikka Huppunen-Vänskä; Enni Sanmark

11:00-12:30 **Session 2c – Data-Driven and Modelling-Based Decision Support & Multimodal Health Data Analysis I**  
H1091, Chair: Simo Saarakkala

**Invited Speech:**

11:00-11:20 · From Multimodal Models to Trustworthy Decision Support: Bridging Data-Driven AI and Clinical Impact  
Professor Karim Lekadir, University of Barcelona, Catalunya

**Scientific Presentations:**

11:20-11:27 · A Multi-Filter and Multi-Scale U-Net for Cone-Beam Computed Tomography  
Mustafa Al-Rubaye; Andreas Hauptmann; Miika Nieminen; Mikael Brix

11:27-11:34	· Robust Running Cadence Estimation Using Multi-Axis IMU in Different Body Locations	Nastaran Taefi Aghdam; Kai Noponen; Timo Hyart; Ahmed Shaheen; Rasmus Valtonen; Mikko Tulppo; Tapio Seppänen
11:34-11:41	· Computer Vision-Based Breast Volume Quantification Using Digital Mammography Data with Manual Measurement Validation	Katariina Kilpivaara; Antti Isosalo; Pasi Ohtonen; Pieta Ipatti; Miika Nieminen; Terhi T Piltonen; Tero Rautio
11:41-11:48	· Multimodal Machine Learning Approach for Timed Up and Go Test Score Prediction from Wearable Gait Data	Nabid Faiem; Tunc Asuroglu; Koray Açıci; Antti Kallonen; Mark van Gils
11:48-11:55	· Latency-Aware Evaluation of Bleeding Monitoring Algorithms for Real-Time Surgical Applications	Prosper Magara; Bessie Malila; Lamees Ras; Sudesh Sivarasu
11:55-12:02	· Explainable Video-Based Facial Expression Analysis for Quantifying Temporal Emotion Dynamics: A Methodological Framework Toward ADHD Research	Sameera Gamage
12:02-12:09	· A Modern Hopfield Network Approach for Alzheimer's and Dementia Classification Using EEG Signals	Bhargava Bhamidipati; Sarthak Acharya; Rajkumar Saini
12:09-12:16	· Synthetic Data-Guided Feature Selection for Robust Activity Recognition in Older Adults	Shuhao Que; Dieuwke van Dartel; Ilse Heeringa; Han Hegeman; Miriam Vollenbroek-Hutten; Ying Wang

11:00-12:30 **Session 2d – Connectivity Architectures and Cybersecurity in Digital Health**  
338B, Chair: Erkki Harjula

**Invited Speech:**

11:00-11:20	· Edge AI in Digital Health	Assoc. Professor Aaron Ding, TU Delft, The Netherlands
-------------	-----------------------------	--

**Scientific Presentations:**

11:20-11:27	· Auditable Continuous Verification for Adaptive Security in Healthcare	Ijaz Ahmad; Erkki Harjula
11:27-11:34	· Cybersecurity Considerations for Home Care Within the Digital Transformation of Healthcare	Jenni Siermala; Hanna Paananen; Jarmo Reponen
11:34-11:41	· End-to-End Architecture for Secure Cardiovascular Disease Risk Assessment and Clinical Care	Gaurang Sharma; Juha Pajula; Tuomas Granlund; Petri Alhainen; Tommi Kiljander; Ornela Bardhi; Jaakko Lähteenmäki; Aada Illikainen; Antti Väänänen; Noora Lipsanen; Sari Kaari; Ville Salaspuro; Mika Hilvo
11:41-11:48	· Secure Cloud-Based Firmware Distribution Architecture for Medical Devices	Dinesh Kumar Sah; Lauri Lovén; Sharon Stephen
11:48-11:55	· Analytical Power Model for SmartBAN Protocol	Thashmila Delkandura Arachchige; Matti Hämäläinen; Konstantin Mikhaylov
11:55-12:02	· An Edge-Cloud Service Orchestration Platform for Cone-Beam CT Image Denoising	Abu Taher; Johirul Islam; Antti Isosalo; Erkki Harjula
12:02-12:09	· Medical Device and System Security in 6G: Learnings from 5G and Edge	Ian Oliver; Kiti Mueller
12:09-12:16	· The Surgical Cyber Safety Checklist	Ian Oliver; Kiran Pokharel; Ganesh Acharya

12:30–14:00 **Lunch, Exhibitions and Posters**

14:00-15:30 **Session 3a – Next-Generation Wireless Health Technologies, Wearable Sensing, and Digital Twin Innovations**

101A (Leena Palotie Hall), Chair: Matti Hämäläinen

**Invited Speech:**

14:00-14:20 · Healthcare in the 5G/6G Era: Opportunities for Wireless Sensing and Monitoring  
Professor Sandra Dudley, London South Bank University, UK

**Scientific Presentations:**

14:20-14:27 · 5G/6G Enabled Ultrawideband Radar-Based System for Non-Contact Remote Monitoring  
Dilshan N. Wickramarachchi; Wai Lwin Phone; Robert Brown; Tasos Dagiuklas; Sandra Dudley

14:27-14:34 · Spectrum Occupancy Characteristics of a Private 5G Network in Hospital Environment  
Mohsin Iqbal Khan; Matti Hämäläinen; Erkki Harjula; Timo J Mäkelä; JaniKatisko

14:34-14:41 · Prediction of Body Composition with a Low-Cost and Wearable Bioimpedance Analysis Device Across Various Body Locations  
Leon Robertz; Nastaran Taefi Aghdam; Joni Kilpijärvi; Egor Panfilov; Tuire Salonurmi; Mika Nevalainen; Seppo Korkala; Tommi Jaako; Simo Saarakkala

14:41-14:48 · The Future of Digital Twins in Healthcare: Results from an Expert Survey  
Kerstin Denecke; Octavio Rivera

14:48-14:55 · Digi-Phy Twin: An Augmented Framework for Medical Applications  
Daljeet Singh; Sarthak Acharya; Rajkumar Saini; Mariella Särestöniemi; Teemu Myllylä

14:55-15:02 · Characterizing Implant to Surface Radio Channels for Brain Computer Interface Applications  
Mariella Särestöniemi; Kamran Sayrafian; Jani Katisko; Mikael von und zu Fraunberg; Teemu Samuli Myllylä; Jari Iinatti

15:02-15:09 · Toward Stroke Rehabilitation: A Single Hand-Mounted IMU and TinyML for Therapeutic Hand Movement Recognition  
Xiru Chen; Sohail Ahmed Soomro; Georgi V. Georgiev

15:09-15:16 · Beyond the Wrist: Wearables as Reflective Infrastructure for Nurse Well-Being  
Ove Lintvedt; Rune Pedersen; Karla Muñoz Esquivel; Nick Timmons

15:16-15:23 · Wearable Device-Based Assessment of Sleep Timing and Structure in Frontotemporal Dementia  
Eeva Alina Nevanranta; Sami Kauppinen; Emma Vitikka; Noora-Maria Suhonen; Kasper Katisko; Barbara Borroni; Anne Portaankorva; Annakaisa Haapasalo; Eino Solje; Mikko Finnilä; Johanna Krüger

**Exhibitor presentations:**

15:23-15:30 · Polar  
15:30-15:37 · Philips

14:00-15:30 **Session 3b – Health Technology Assessment & Impact Evaluation**

F202, Chair: Miia Jansson

**Invited Speeches:**

14:00-14:20 · Evaluation of Digital health technologies in Europe: from fragmentation to the harmonised european EDIHTA framework  
Research Project coordinator Emmanouil Tsiasiotis, Università Cattolica del Sacro Cuore, Italy

14:20-14:40 · What societal-economic effects can be identified from the implementation and use of eHealth services in the Nordic Countries? Issues and challenges to measure outputs  
 Professor Emerita Vivian Vimarlund, Linköping University, Sweden

**Scientific Presentations:**

14:40-14:47 · Clinical Investigation of Health Technologies: A Scoping Review of Evaluation Methods  
 Axa Saukkonen; Henna Härkönen; Jenna Syrjälä; Minna Vanhanen; Elina Laukka; Paulus Torkki; Kirsi Talman; Monira Yesmean; Miia Jansson

14:47-14:54 · Development of an Assessment and Reimbursement Model for Digital Therapies in the Finnish Healthcare System  
 Jari Haverinen; Raija Järvinen; Teemu Mustola; Petra Falkenbach

14:54-15:01 · Post-Implementation Monitoring of CE-Marked AI-CDS in Radiology: A Longitudinal Mixed-Methods Evaluation of Spread, Scale-Up, and Sustainability  
 Line Silsand; Gro-Hilde Severinsen

15:01-15:08 · Waiting Times from the Real-World Earliest Contacts to Realized Visits to Public Primary Healthcare in 2019-2025 in Finland: A National Register Study  
 Vesa Jormanainen

15:08-15:15 · HTA and Ethical Impact Assessment: Preliminary Perspectives  
 Jaakko Hakula

15:15-15:22 · A Novel Smartphone App Increases Smoking Cessation, Participants' HRQoL and Cost-Effectiveness in LDCT Lung Cancer Screening of Heavy Smokers  
 Antti Kurtti; Sanna Iivanainen; Jussi Koivunen

15:22-15:29 · Coverage and Utilization of Digital Healthcare Services: A Registry-Based Observational Study  
 Alexandra C. H. Dahlberg; Taavi Kaartinen; Sakari Jukarainen; Petja Orre

15:29-15:36 · Development of Health Promotional Support Service Based on the Mobile Personal Health Record Application to Prevent Heart Failure  
 Hiromasa Ito; Naoki Fujimoto; Kaoru Dohi

14:00-15:30 **Session 3c – Education in Digital Health I**  
 H1091, Chair: Erika Jarva

**Invited Speech:**

14:00-14:20 · Learning with Intelligent and Immersive Systems: Rethinking Education in Digital Health  
 Maryam Alimardani, Associate Professor at Vrije Universiteit Amsterdam, Netherlands

**Scientific Presentations:**

14:48-14:55 · Induction of Empathic Concern and Cognitive Empathy with Experts and Adults in an Immersive Virtual Reality Magnetic Resonance imaging (MRI) Experience with child's perspective  
 Iresh Bandara; Paula Alavesä; Severi Pitkänen; Sirpa Kekäläinen; Nirasha Thennakoon; Tarja Pölkki

- 14:20-14:27 · Designing Safe Hybrid AI-XR Simulations for Healthcare Communication and Interaction Training  
Kristina Mikkonen; Egle Butkeviciute; Patrikas Armalis; Evelina Aluzaitė; Rita Baranauskaite; Lukas Paulauskas; Lina Spirgiene; Andrejus Subocius; Tomas Blažauskas; Olga Riklikienė
- 14:27-14:34 · Examining Nursing Students' Perceptions of Virtual Reality for Language Learning and Culture Immersion  
Agostinho Antônio Cruz Araújo; Paula Ropponen; Sari Pramila-Savukoski; Lucas Gardim; Isabel Amélia Costa Mendes; Kristina Mikkonen
- 14:34-14:41 · Paramedic and Nursing Students' Experiences of Developing Pre-Hospital Emergency Care Competence Using Mobile Game - a qualitative study  
Sari Pramila-Savukoski; Sofia Jaakkola; Heli-Maria Kuivila; Petri Roivainen; Erika Jarva; Hanna-Mari Ylitalo; Kristina Mikkonen
- 14:41-14:48 · Temporal Stress Patterns in VR-Based Trauma Care Training: a multimodal study of nursing students' physiological and interactional responses  
Laura Kohonen-Aho; Delfin Tursin; Joonas Ojanen; Matti Pouke; Kristina Mikkonen
- 14:55-15:02 · Co-Teaching with Machines: Generative AI in Simulation-Based Education  
Nicholas Wee Siong Neo; Joko Gunawan; Tracy Levett-Jones; Eng Tat Khoo; Wei Ling Chua; Sok Ying Liaw
- 15:02-15:09 · SurgiVerse-6G: AI Surgical Intelligence for Education  
Paulo Sergio Rufino Henrique; Ramjee Prasad; Wagner de Oliveira; Marco Antonio Firmino de Sousa; Graça Bressan; Ricardo Zugaib Abdalla; Pavlos I. Lazaridis
- 15:09-15:16 · MetaHealth Infra and MetaHealth Infra Development Projects: Building an Immersive Digital Development and Testing Environment for the Health Sector  
Mika Paldanius; Outi Kajula

15:30-16:00 **Coffee, Exhibitions and Posters**

16:00-17:30 **Session 4a – AI and LLMs in Healthcare: Tools for Professionals, Support for Citizens I**  
101A (Leena Palotie Hall), Chair: Daljeet Singh

**Invited Speech:**

16:00-16:20 · LLM for clinical text handling: Recent Advances and Challenges  
Professor Mourad Oussalah, University of Oulu, Finland

**Scientific Presentations:**

- 16:20-16:27 · Deep Learning Models for Human Activity Recognition Using a Chest-Wearable Accelerometer Sensor  
DK Arvind; Passara Chanchotisatien
- 16:27-16:34 · Prognostic Risk Stratification of Hypertrophic Cardiomyopathy  
Long Dang; Felix Agakov; Jari Hyttinen; Iacopo Olivotto; Mark van Gils
- 16:34-16:41 · Trustworthy Federated Machine Learning in Healthcare: A Sociotechnical and Risk-Based Evaluation Using the Z-Inspection® Method  
Pedro Kringen; Antti P Happonen; Petra Ekman; Charles Vesteghem; Benjamin Barlous; Antonios Danelakis; Mark van Gils; Pedro A Moreno-Sánchez; Magnus Westerlund

16:41-16:48	• Feasibility of deep learning-based classification of lumbar T2-weighted MRIs in subjects with and without low back pain symptoms	Mustafa Al-Rubaye; Satu Inkinen; Jaro Karppinen; Miika Nieminen; Juuso Ketola
16:48-16:55	• EEG-Based Mental Workload Classification Using Machine Learning in Software Engineering Tasks: A Methodological Approach	Sameera Gamage; Pantea Keikhosrokiani; Minna Isomursu
16:55-17:02	• Real-Time Thermal Monitoring and Respiratory Analytics on Edge AI for Remote Healthcare	Christian Schuss; Kari Remes; Atte Koskela; Tapio Fabritius
17:02-17:09	• Ethical Impact of AI Systems in Health-care: A Survey of Recorded Incidents	Lauri Tuovinen
17:09-17:16	• Alternative Regulatory Strategies for AI Medical Devices in the EU	Alpo Varri; Ilkka Juuso
17:16-17:23	• Evaluating Predictive Performance of Machine Learning Based Patient Selection for Spinal Cord Stimulation in Chronic Pain	Mohosina Akhter; Minna Isomursu
17:23-17:30	• A Human AI Digital Health Architecture for Scalable Visually Impaired People (VIP) Navigation	Babar Shahzad Chaudary; Erkki Harjula; Petri Pulli

16:00-17:30 **Session 4b – User Experience, Acceptance & Adoption of Health Information Systems**  
F202, Chair: Vesa Jormanainen

**Invited Speeches:**

16:00–16:20	• What are the factors for success and non-success in electronic health record systems implementations?	Professor Christian Nøhr, Aalborg University, Denmark
16:20-16:40	• Digital health experiences from a patient perspective	Assoc. Professor Jeppe Eriksen, Aalborg University, Denmark.

**Scientific Presentations:**

16:40-16:47	• Determinants of Citizen Adoption of the EUDI Wallet for Health Services in Finland: A Scoping Review and Conceptual Framework	Khaled Md Saifullah; Mohammad Rakibur Rahman; Miguel Bordallo Lopez; Timo Koivumäki; Kristina Mikkonen; Minna Isomursu; Olli Silvén; Constantino Alvarez Casado
16:47-16:54	• Paramedicine Speech Recognition Adoption: A Socio-Technical Ranking Study	Desmond Hedderson; Helen Monkman; Ian E Blanchard; Karen L Courtney
16:54-17:01	• Towards Healthy Ageing: Design and Implementation of a Person-Centered Digital Health System	Michele Atzeni; Margherita La Gamba; Laura Giani; Gokce B Laleci Erturkmen; Erika Jarva; Iiro Nerg; Sylvain Sebert; Teija Juola; Maria Bulgheroni
17:01-17:08	• Assessing Community Health Workers' Experiences with Digital Rehabilitation: Usability, Barriers, and Implementation Needs in Primary Care Settings	Michael Oduor; Gerard Urimubenshi; Juliette Gasana; Eeva Aartolahti; Nassib Tawa; David Tumusiime; Katariina Korniloff
17:08-17:15	• Surveying Nurses' Experiences of the National Patient Portal	Tuulikki Vehko; Kaija Saranto; Marko Elovainio; Vesa Jormanainen; Ulla-Mari Kinnunen

- 17:15-17:22 · Nurses' Experiences Regarding the Impact of the Implementation of Digital Health and Social Center on Their Work and Other Practices: A Qualitative Interview Study Egne Annala; Taina Pellikka; Hilikka Korpi; Janna Nadav; Anu Kaihlanen; Paulus Torkki; Elina Laukka
- 17:22-17:29 · Nurses' Usability Perceptions of an Established and Newly Adopted Electronic Health Record System, and Associations with Work Schedules Signe Lohmann-Lafrenz; Eivind Schjelderup Skarpsno

16:00-17:30 **Session 4c – Wearable Sensors, Antennas and Physiological Measurement Systems**

H1091, Chair: Mariella Särestöniemi

**Invited Speech:**

- 16:00-16:20 · Wearable Sensing for Health Monitoring in Real-World Conditions Professor Oliver Amft, University of Freiburg, Germany

**Scientific Presentations:**

- 16:20-16:27 · Evaluation of Two Novel Methods for Infant Sleep Depth Measurements in Home Environment Laura Nauha; Hannu Kinnunen; Riikka Marttila; Matias Häggman; Juha Hannula; Tarja Pölkki; Sampsa Vanhatalo
- 16:27-16:34 · Infrastructure Platform for Real-Time Blood Flow Imaging and Vascular Hemodynamics Monitoring Ivan Lopushenko; Ana Diaz Dochado; Anton Sdobnov; Oleksii Sieryi; Mika Kaakinen; Lauri Eklund; Alexander Bykov
- 16:34-16:41 · Liquid-Based Polarization-Reconfigurable Antenna Using Gravitational Method for WBAN Applications Thanatchcha Satitchantrakul; Niklas Takanen; Ping Jack Soh
- 16:41-16:48 · AMC-Backed Antenna for mmWave 5G Wearable Applications Chaïmaâ Kissi; Mohamed Nabil Srifi
- 16:48-16:55 · Skull Fracture Detection Using a Wideband Circularly Polarized Antenna with Metasurface Plane Emmi Kaivanto; Mariella Särestöniemi; Teemu Samuli Myllylä; Ping Jack Soh; Jarmo Reponen; Mikael von und zu Fraunberg; Daljeet Singh; Kai Zhang; Sen Yan
- 16:55-17:02 · Skin-to-Skin Interventions Provided Promising Results During Neonates' Recovery from Pain Stimulation Hany Ferdinando; Anna-Kaija Palomaa; Sadegh Moradi; Juha Hannula; Tarja Pölkki; Teemu Samuli Myllylä
- 17:02-17:09 · Bridging Science and Well-Being: Medical DX and Innovative Cuffless Sensors for Preventive Medicine Yasuko K Bando
- 17:09-17:16 · PPG and ECG Measurements on Physical Stimuli Matti Huotari
- 17:16-17:23 · New Vision-Portable and Label-Free Optical Detection of Sweat Glucose Using Functionalized Plasmonic Nanopillar Array Ling Liu; Jianan Huang; Kuo Zhan

**Exhibitor presentation:**

- 17:23-17:30 · PLM Group

19:30 **Gala dinner at Restaurant Toivo of Radisson Blu Hotel**

For those who have booked the dinner at the time of conference registration

## Wednesday 17.6.2026

8:00-08:30 **Bus transportation from hotels to site visits**

8:30 – 10:30 **Site Visits**

**Bus transportation from site visits to Kontinkangas campus**

10:30 – 11:00 **Coffee, Exhibitions and Posters**

11:00-12:30 **Session 5a – AI and LLMs in Healthcare: Tools for Professionals, Support for Citizens II**

101A (Leena Palotie Hall), Chair: Miika Nieminen

### **Invited Speech:**

11:00-11:20 · Human-Centered Large Language Models in Healthcare: Quality, Interaction, and Responsibility  
Professor Lucie Flek, University of Bonn, Germany

### **Scientific Presentations:**

11:20-11:27 · Comparative Analysis: AI and LLMs in Healthcare  
Syed Ifham Qadri; Syed Rameem Zahra; Juha Röning; Brijesh Lall

11:27-11:34 · EH-FSL: Secure and Scalable Edge-Hosted Federated Split Learning in Data-Intensive Healthcare  
Bilgehan Akdemir; Erkki Harjula

11:34-11:41 · Physiotherapists' Perspectives on AI Tools for Future Practice  
Tuulikki Sjögren; Hilkka Korpi; Sanna Laine; Ville Heilala

11:41-11:48 · Generating BPMN Healthcare Process Models Using LLMs  
Adam Grík; Silvia Putekova; Anna Petulova; Marek Rabczak; Fedor Lehocki

11:48-11:55 · Delegating Tasks to AI: Current State in Dental Healthcare  
Ville Tuominen; Jaakko Vuolasto; Kari Koskinen

11:55-12:02 · Pre-Treatment Chemotherapy Resistance Prediction in Endometrial Cancer  
Niny Salma; Chaimaâ Kissi; Ch. Pradeep Reddy; Mohamed Nabil Srfi

12:02-12:09 · Environmental Impacts of AI in Health Decision-Making  
Iina Latva-Teikari; Elina Hyrkäs; Outi Kanste

12:09-12:16 · Measuring the Quality of AI-Generated Clinical Notes: A Systematic Review and Experimental Benchmark of Evaluation Methods  
Alexandra C H Dahlberg; Tiila Käenniemi; Tiia Winther-Jensen; Olli Tapiola; Rami Luisto; Tuukka Puranen; Max Gordon; Enni Sanmark; Ville Vartiainen

12:16-12:23 · Structured Multi-Extraction Prompting Improves LLM-Based Biomedical Relation Extraction Without Fine-Tuning  
Frederik Marten Labonté; Suraj Giri; Claudius Herbrink; Lucie Flek

11:00-12:30 **Session 5b – Data-Driven and Modelling-Based Decision Support & Multimodal Health Data Analysis II**

F202, Chair: Mark van Gils

### **Invited Speech:**

11:00-11:20 · Learning health systems as enabler of value-based care  
Professor Arild Faxvaag, Norwegian University of Science and Technology, NTNU, Trondheim, Norway

### Scientific Presentations:

- 11:20-11:27 · Establishing an AI Competence Center in a Public Healthcare Organization Timo Alalääkkölä; Aappo Keränen; Jaana Kokko; Niko Korhonen; Roni Huhta; Joonas Haataja; Tenho Moilanen; Miika T Nieminen; Mikko Reinikka; Jarmo Reponen; Heikki Mikkonen
- 11:27-11:34 · Extending Customer Journey Modelling Language for Complex Healthcare: A Design Science Research Approach in Kidney Cancer Care Essi Miettinen; Anu Vehkamäki; Märta Vesinurm
- 11:34-11:41 · Breath-Hold Effect on the Prefrontal Cortex Hemodynamics When Measured by fNIRS at Source-Detector Distances of 3 and 5 cm Sadegh Moradi; Davood Simyar; Hany Ferdinando; Teemu Samuli Myllylä
- 11:41-11:48 · Continuous Measurement of Cardiovascular Markers Using SCG During Cycle Ergometer Test Aleksandra Zienkiewicz; Mikko Tulppo; Rasmus Valtonen; Teemu Samuli Myllylä
- 11:48-11:55 · Lightweight, Explainable, and Efficiency-Aware Deep Learning for Early Sepsis Prediction from Structured Electronic Health Record Time-Series Attaphongse Taparugssanagorn; Mariella Särestöniemi; Matti Hämäläinen; Jari Iinatti
- 11:55-12:02 · Robust Fatigue Prediction via Hybrid Generative-Ensemble Learning on Wearable Data Fatemeh Sepehrmanesh; Antti Isosalo; Erkki Harjula
- 12:02-12:09 · Attitudes Towards Workplace Data Collection Among Factory Workers Milla Immonen; Satu-Marja Mäkelä; Elina Annanperä; Anna Rohunen; Kari Hiekkänen; Anu-Hanna Anttila; Pekka Siirtola
- 12:09-12:16 · Focus is Not Just on the Eyes - Constructing Dynamic Areas of Interest for Eye-Tracking Jaakko Kauramäki; Kerttu Huttunen
- 12:16-12:23 · Multimodal Driver State Monitoring in a Simulated Environment: A Health-Oriented, Human-in-the-Loop Evaluation Prabhath Rathnayake; Sameera Gamage; Akke-Pekka Törmänen; Ella Peltonen
- 12:23-12:30 · Task-Dependent Central and Autonomic Responses to Sympathetic and Vagal Challenges Runwei Lin; Annemijn Hoff; Ying Wang

11:00-12:30 **Session 5c – Education in Digital Health II**  
H1091, Chair: Kristina Mikkonen

### Invited Speech:

- 11:00-11:20 · Education and Competence Development in Digital Health Professor and Deputy Dean Gillian Vesty, Melbourne, Australia

### Scientific Presentations:

- 11:20-11:27 · Educators' Perceptions of a National Learning Material Repository in Finnish Medical and Dental Education Tiina Salmijärvi; Konsta Parttimaa; Henri Takalo-Kastari; Anu Kajamaa; Hanni Muukkonen; Petri Kulmala; Jarmo Reponen

11:27-11:34	· Defining AI Competence for Health and Social Care Professionals: A Scoping Review of Competence Domains, Practice Requirements and Educational Gaps (2020–2025)	Birgitta Tetri; Outi Ahonen
11:34-11:41	· From Shared Input to Negotiated Comparison and Situated Action: Staging a Transnational Course in Digital and Data-Driven Healthcare	Casper Knudsen; Signe Pedersen; Ditte Lystbæk Weber
11:41-11:48	· Medical Students' Experiences of Digital Collaborative Learning in eHealth Training	Paula Veikkolainen; Erika Jarva; Timo Tuovinen; Petri Kulmala; Tiina Salmijärvi, Jonna Juntunen; Annukka Tuomikoski; Jarmo Reponen; Merja Männistö
11:48-11:55	· Digital Competence of Filipino Nurses Working in Finland: A Cross-Sectional Study	Erika Jarva; Floro Cubelo; Elina Laukka
11:55-12:02	· Exploring Digital Health Concepts Through Hands-on Education in Biomedical Engineering	Christian Schuss; Atte Koskela; Anuradha Uduwana Athukoralalage Dona; Tapio Seppänen; Tapio Fabritius
12:02-12:30	· Pioneering the Future of Healthcare: The Development and Implementation of an Interdisciplinary Master's Program in Digital Health in Japan – a Case of Regional University	Kakuya Kitagawa; Yasuko K Bando; Hiroharu Kawanaka; Yusuke Sugitani; Hajime Sakuma
12:30-14:00	<b>Lunch, Exhibitions and Posters</b>	
14:00-15:30	<b>Closing Plenary – Future of Digital Health</b> Chair: Simo Saarakkala	
	<b>Invited Speeches:</b>	
14:00-14:30	· Digital Transformation of Primary Health Care: Insights from a multi-country study	Assoc. Prof. Smisha Agarwal, Johns Hopkins, USA
14:30-14:50	· From Vision to Infrastructure: The Evolution of Taiwan's Healthcare Systems Consortium in the Digital Age	Prof. Shao-Jen Weng, Tunghai University, Taiwan
14:50-15:10	· From Strategy to Practice: The Esko Patient Information System Implementation at Pohde	CIO, Assist. Prof. Pasi Eskola, Wellbeing Services County of North Ostrobothnia, Finland
15:10-15:25	<b>Best Paper Awards</b>	
15:25	<b>Closing ceremony</b> · Closing words	
	Conference Vice-President, Prof. Simo Saarakkala, University of Oulu, Finland	
	<b>Poster exhibitions</b>	
1	· From Guideline to Gameplay: A Pilot Study on AI Simulation in Medical Training	Maija Paukkunen; Elina Rintamäki; Kari Sinivuori; Eveliina Heikkala; Juhani Määttä; Jaro Karppinen
2	· Impact of XR-Based Training on Radiation Knowledge and Workflow Performance in Healthcare Professionals	Marja Jaronen; Karoliina Paalimäki-Paakki; Adam Graham; Niko Männikkö; Tanja Schroderus-Salo; Tuulikki Kesitalo; Milla Immonen; Kristina Mikkonen

3	• Industry-Driven Project-Based Learning in Digital Health Education	Raquel Simões de Almeida; Vítor Simões-Silva; Maria João Trigueiro
4	• Low-Cost Platform for Self-Measured Balance in Seniors	Thomas Jensen; Pauli Mikkonen
5	• A User-Centred mHealth Approach to Remote Routine Management and Mental Health Promotion in Higher Education	Vítor Simões-Silva; Maria João Trigueiro; Raquel Simões de Almeida
6	• Use of a Gamified Tool for the Promotion of Physical Activity and the Reduction of Obesity in Young Adults	Maria João Trigueiro; Guilherme R Pinto; José M Nunes; Raquel Simões de Almeida; Vítor Simões-Silva
7	• A Phenomenographic Research of Physiotherapy Teachers' Perceptions of Digitalization	Hilkka Korpi; Mari Harjunen; Tuulikki Sjögren
8	• Artificial Intelligence-Assisted Clinical Decision Support in Nursing: A Qualitative Descriptive Study	Petra Suonnansalo; Henna Härkönen; Mika Alastalo; Zhou Wentao; Miia Jansson
9	• Self-Adaptive AI in Clinical Decision Support: A Systematic Review	Wendakoon Mudiyansele Kavishwa Bhashitha; Nirnaya Tripathi
10	• Artificial Intelligence for Reducing Alarm Fatigue in Hospitals: A Systematic Review	Milla Kosonen
11	• A Safety-Constrained Architecture for Adaptive Clinical Decision Support	Wendakoon Mudiyansele Kavishwa Bhashitha; Nirnaya Tripathi
12	• Structured LLM-Generated Clinical Discharge Summaries for Nordic Healthcare Digitalization and Wireless Health Integration	Aleka Melese Ayalew; Md Rabiul Hasan; Tapio Seppänen; Mourad F Oussalah
13	• MEG-QA: Medical Evidence-Grounded Question Abbreviation for Consumer Health Queries via Retrieval-Augmented Generation and Knowledge Graph Constraints in Digital Health	Md Rabiul Hasan; Aleka Melese Ayalew; Mourad F Oussalah
14	• Robust and Imperceptible QR Code Watermarking in Medical Images Using a Hybrid DWT-DCT-SVD Approach	Khadija Dinia; Chaïmaâ Kissi; Ch. Pradeep Reddy; Tarik Boujiha
15	• An Evaluation of PQC Placement in Hybrid Quantum CNN and ViT Models	Khadija Amadoun; Chaïmaâ Kissi; Amlan Chakrabarti; Tarik Boujiha
16	• Early Detection of Emerging SARS-CoV-2 Variants via Contrastive Siamese BiLSTM Embeddings and Temporal Outlier Persistence	Adnane Touiyate; Chaïmaâ Kissi; Tarik Boujiha
17	• AI-Assisted Documentation in Social Welfare Services: Insights from a Pilot Conducted in the Wellbeing Services County of North Ostrobothnia	Niko Korhonen; Jarmo Reponen; Timo Alalääkkölä; Aappo Keränen; Jaana Kokko; Roni Huhta; Joonas Haataja; Tenho Moilanen; Miika T Nieminen; Mikko Reinikka; Heikki Mikkonen
18	• WoMED: Designing a Clinical Tool to Aid in Diagnosis, Assessment, and Decision-Making by Utilizing Women's Health Data	Riikka Arffman; Marko Arffman; Janne Wäli; Elisa Hurskainen; Terhi T Pilttonen

19	· A Discrete Event Simulation Framework for Analysing and Optimising Emergency Medical Service Workflows	Kean Tang; Patrik Rydén
20	· Predicting Length of Stay in High Throughput Hospital Units	Lars Mattsson; Patrik Rydén
21	· Service Demand Predictive Models in Well-Being Services Counties Qualitative Research on Project Team Members' Experiences	Helmi Virtanen
22	· Multiparametric MRI Analysis in Glioma Grading: Added Value of ADC Maps	Nourhan Ibrahim; Egor Panflov; Niina Salokorpi; Tuija Keinänen
23	· Optical Wireless Power and Data Transfer to Implantable Medical Devices Under Misalignment: Experimental Insights on Energy Harvesting	Syifaul Fuada; Mariella Särestöniemi; Guanghui Ma; Marcos Katz
24	· Analysis of Available Optical Power in an in-Body Optical Link at 810 nm for OWPT Across Biological Tissue	Syifaul Fuada; Mariella Särestöniemi; Marcos Katz
25	· Compact Antenna Cavity and Reflector Configurations for Portable Skull Fracture Detection	Emmi Kaivanto; Daljeet Singh; Jarmo Reponen; Mariella Särestöniemi; Mikael von und zu Fraunberg; Ping Jack Soh; Teemu Samuli Myllylä
26	· Ultra-Low-Power on-Demand Ultrasound-Based Device Identification for Hand Hygiene Monitoring in Healthcare Environments	Frank Russow
27	· Secure Connectivity Architectures for Resilient and Privacy-Preserving Digital Health Ecosystems	Himanshi Babbar; Rajeev Kumar; Teemu Myllylä; Daljeet Singh; Mariella Särestöniemi
28	· A Modular Approach for Multi-Scale Whole-Brain Simulation: Integrating a Neuron-Astrocyte-Vascular Model Into the Virtual Brain	Rok Virant; Marja Leena Linne
29	· Wearable-Measured Heart Rate Variability, Its Multi-Night Fluctuation and Cardiometabolic Health in Adults	Anna Maijala; Vahid Farrahi; Maisa Niemelä
30	· BCI Controlled Humanoid Systems: A Multimodal Perspective	Sarthak Acharya; Daljeet Singh; Nampuraja Enose
31	· The Human Body Twin Laboratory: A Multimodal Platform for Developing and Validating Wearable and Portable Medical Monitoring Technologies	Mariella Särestöniemi; Erkki Vihriälä; Daljeet Singh; Lukasz Surazynski; Teemu Myllylä
32	· Human-AI Interaction in UAE Healthcare Sector	Loubna Saad Saoud; Omer Aftab Qureshi
33	· Towards Realistic Phantom-Based Evaluation of MammoWave Microwave Breast Imaging	Mariella Särestöniemi; Daljeet Singh; Jarmo Reponen; Teemu Myllylä; Gianmarco Palomba; Alessandra Ronca; Navid Ghavami; Gianluigi Tiberi
34	· Cost-Effectiveness of a Metabolomic Risk Score-Based Health Check Combined with a Digital Health Intervention for Cardiometabolic Disease Prevention in Finland	Piia Lavikainen, Leena Haikonen-Salo, Aku-Ville Lehtimäki, Kari Jalkanen, Jari Heiskanen, Tiina Laatikainen, Janne Martikainen



Nest

# Conference Proceedings

---

The **Conference Proceedings** are available as a three volume Springer CCIS series book in the following websites:

## Part I

**Digital Health and Wireless Solutions: Towards Trustworthy and Person-Centric Digital Health**  
<https://link.springer.com/book/9783032288110>

## Part II

**Digital Health and Wireless Solutions: Integrating AI, LLMs and Multimodal Health Data for Next-Generation Decision Support**  
<https://link.springer.com/book/9783032288189>

## Part III

**Digital Health and Wireless Solutions: Connected Digital Health: Digital Twins, Wearables, Wireless Systems, and Secure Architectures**  
<https://link.springer.com/book/9783032288288>

The volumes include full papers and short papers, which are published as Open Access and appear in the same order as in the program, as well as Abstracts which appear at the end of volumes.



The Proceedings can be referred as:

Author1Surname, X.: Paper Title. In: Särestöniemi M., Singh D., Jarva E., Reponen J. (eds.) Nordic Conference on Digital Health and Wireless Solutions 2026 (NCDHWS2026). CCIS, vol. 3009-3011, pp. XX. Springer, (2026).



# Committees

---

## General Chairs

- **Conference President:** Jarmo Reponen
- **Conference Vice-President:** Simo Saarakkala

## Coordinators

- Chao Ding, 6GESS
- Tuire Salonurmi, 6GESS

## Scientific committee

- **Chair:** Mariella Särestöniemi, HST / CWC / 6GESS
- Daljeet Singh, HST / 6GESS
- Erkki Harjula, CWC / 6GESS
- Minna Isomursu, M3S / 6GESS / HD
- Miia Jansson, HST / DigiHealth
- Erika Jarva, HST
- Mark van Gils, TUNI
- Jarmo Reponen, HST / 6GESS
- Johanna Uusimaa, 6GESS / OBM
- Johannes Kettunen, PopH / Biocenter / HD
- Mika Martikainen, Clinical Medicine / OBM
- Janne Hukkanen, Biomedicine and Internal Medicine / Fibrobesity
- Ali Mobasheri, HST / Fibrobesity

## Organizing committee

- **Chair:** Jarmo Reponen
- **Vice-Chair:** Simo Saarakkala
- Chao Ding, 6GESS
- Tuire Salonurmi, 6GESS
- Mariella Särestöniemi, 6GESS
- Erkki Harjula, 6GESS
- Matti Hämäläinen, 6GESS
- Minna Isomursu, 6GESS / HD
- Johanna Uusimaa, 6GESS / OBM
- Miia Jansson, LTK / DigiHealth
- Salla Kangas, OBM
- Ritva Saastamoinen, HD
- Essi Erkkilä, Fibrobesity
- Minna Komu, OuluHealth / BusinessOulu
- Teija Kekonen, Pohde
- Elina Laukka, OAMK
- Mark van Gils, TUNI

## Event communications team

- Katja Longhurst, 6GESS
- Sallamaari Syrjä, 6GESS

We would also like to thank our International Reviewer Committee and International Advisory Committee.

Their full listing is available in the conference website <https://nordic-digihealth.com/committees> and in the conference books.



## Exhibitors

---

**DIGITAL  
HEALTH  
FINLAND**

 **OYSTER**  
INCUBATOR

**PHILIPS**

 | WE MAKE  
YOU INNOVATE

**POLAR**®



Taiwanese Chamber of Commerce in Finland

**Esko**  
Systems

**GOFORE**

**nucu**

### **Package A:**

Philips  
Oyster Incubator  
Taiwanese Chamber of Commerce in Finland  
Digital Health Finland  
Polar Electro  
PLM Group Suomi

### **Package B:**








Esko Systems  
Gofore Oyj

### **Package C:**

Nucu

# Exhibitor Area



- |  |                      |   |                  |
|--|----------------------|---|------------------|
|  | Registration         |  | City of Oulu     |
|  | Exhibitors Package A |  | Posters          |
|  | Exhibitors Package B |  | Profiling themes |
|  | Exhibitors Package C |   |                  |

# DIGITAL HEALTH FINLAND



## Finnish digital health expertise for international markets

**Digital Health Finland** brings together companies, public sector organizations, and research actors to accelerate the international growth and export of Finnish digital health solutions, services, and expertise.

The network creates joint market opportunities, develops Finnish offering packages for international markets, and connects members with global partners and customers.

As a member, you can:

- Access international business and collaboration opportunities
- Join joint Finnish export and offering initiatives
- Connect with key stakeholders, partners, and customers
- Shape Finnish digital health offerings for global markets

**Bringing Finnish digital health solutions to the world – together.**

[digitalhealth.fi](https://digitalhealth.fi) • [digitalhealth@digifinland.fi](mailto:digitalhealth@digifinland.fi)



Ministry of  
Social Affairs and Health



Ministry for Foreign  
Affairs of Finland



HealthTech  
Finland

**BUSINESS  
FINLAND**



UNIVERSITY  
OF OULU

**DigiFinland**



# HOME OF FUTURE PEARLS



**OYSTER**

INCUBATOR

[ouluhealth.fi/oyster/](https://ouluhealth.fi/oyster/)



Co-funded by  
the European Union



POHJOIS-  
POHJANMAA  
COUNCIL OF OULU REGION

# PHILIPS



## Better care for more people

In healthcare, time means more. But there's simply not enough time. Our innovations are giving back time for what matters most. More time to see, diagnose, and realize the best possible outcomes for patients everywhere. Better care for more people.

Discover more: [www.philips.fi/healthcare](http://www.philips.fi/healthcare)

# Nordic Digital Health Wearables



**POLAR**<sup>®</sup>

# TAIWAN PAVILION

Nordic Conference on  
Digital Health and  
Wireless Solutions 2026



Dates: June 16–17, 2026



Venue: Kontinkangas Campus,  
University of Oulu



## AI × HEALTHCARE × NORDIC INNOVATION

Connecting Taiwan's AI innovation, clinical validation, and global resources to accelerate Digital Health solutions worldwide.



TAIWAN-NORDIC  
INNOVATION  
BRIDGE

### OUR ECOSYSTEM PARTNERS



紳太國際股份有限公司  
Accelerator Guardian Corp.

#### AG CORP

GLOBAL MARKET EXPANSION &  
GO-TO-MARKET SOLUTIONS

Bridging cross-border clinical applications through global medical networks to accelerate clinical acceptance and unlock international growth.



醫療系統聯盟  
Healthcare Systems Consortium

#### HSC

CROSS-DISCIPLINARY HUB &  
CLINICAL VALIDATION ALLIANCE

Connecting healthcare institutions and innovators to achieve real-world clinical validation and operational excellence.



Taiwanese Chamber of Commerce in Finland

#### TCC FINLAND

LOCAL NORDIC RESOURCES &  
STRATEGIC MARKET GATEWAY

Your gateway to Northern Europe—delivering local insights, public-sector connections, and channel expansion resources.



#### K&C INTERNATIONAL LAW FIRM

INTERNATIONAL REGULATORY &  
IP INFRASTRUCTURE SHIELD

Providing legal protection and compliance with EU regulations, GDPR, and global IP strategies.

### HIGHLIGHTS



#### TAIWAN-NORDIC INNOVATION BRIDGE

Building long-term partnerships between Taiwan and Northern Europe.



#### REAL CLINICAL APPLICATIONS

Explore proven solutions and clinical validation opportunities.



#### INVESTOR & ENTERPRISE NETWORKING

Connect with investors, enterprises, hospitals, and innovators.



#### FAST-TRACK EUROPEAN ACCESS

Navigate EU regulations, GDPR, and market entry with local support.



#### CROSS-BORDER COLLABORATION

Co-create and scale innovations across borders.

VISIT THE

## TAIWAN PAVILION

Let's shape the future of digital health together!

MEET US.  
COLLABORATE.  
INNOVATE.

See you in Oulu!



AI INNOVATION



DIGITAL HEALTH



GLOBAL CONNECTION



TRUST & COMPLIANCE



SUSTAINABLE GROWTH



**Finland Convention Bureau** is responsible for promoting Finland for meetings, congresses and business events. To improve our services, we would highly appreciate your views and comments on Finland as a congress destination.

Thank you very much for your time and valuable feedback!



**Scan to answer the survey**



**Oulu Guide**  
powered by [www.reveel.guide](http://www.reveel.guide)

## Looking for things to do in Oulu?

Explore the best ideas, restaurants, saunas and much more in our mobile guidebook.

**OULU**  
BUSINESS EVENTS  
CONVENTION BUREAU





Enabling Sustainable Society

UNIVERSITY OF OULU

## 6G Enabling Sustainable Society

---

The 6G-enabled sustainable society (6GESS) programme capitalises on 6G Flagship's technological expertise to develop the scientific framework for a data-driven, hyper-connected future society in which digital eHealth and future energy systems are intertwined.

6GESS looks into new technologies to help make healthcare and energy systems more democratic and efficient in the future. It also helps healthcare and energy providers and citizens become more involved in developing and using data-driven and digitised solutions.

6GESS is a collaborative endeavour of four faculties: Medicine, ITEE, Technology, and Oulu Business School. 6GESS works closely with the OuluHealth ecosystem, the Oulu University Hospital, and the Future Hospital 2030 project.

## Contact Us

---

**Professor Simo Saarakkala**, Director 6GESS  
simo.saarakkala@oulu.fi

**Professor Ari Pouttu**, Vice Director 6GESS  
ari.pouttu@oulu.fi

**Chao Ding**, Coordinator, Energy  
chao.ding@oulu.fi

**Tuire Salonurmi**, Coordinator, Health  
tuire.salonurmi@oulu.fi



[6gflagship.com/6gess](https://6gflagship.com/6gess)

## 6GESS Health themes

---

### **Citizen-centered health data solutions**

We must rethink healthcare to make it more sustainable, intelligent, citizen-centred, proactive, and predictive in the future. This theme investigates how the rapid advancement of digital technology and data science might provide people with new ways to care for their health and manage their lives based on the most recent facts.

**Professor Minna Isomursu**  
minna.isomursu@oulu.fi

**Professor Petri Ahokangas**  
petri.ahokangas@oulu.fi

### **Ubiquitous digital care pathways and service models in secure and intelligent environments**

The aim of this health theme is to develop advanced digital care pathways between patients and primary care, hospitals, and virtual healthcare services, allowing for more efficient participation and extended communication with patients and healthcare professionals on multiple levels while improving the security, privacy, and trust, as well as the quality and reliability of various smart environments, digital applications, and healthcare services.

**Adjunct Professor Matti Hämäläinen**  
matti.hamalainen@oulu.fi

**Professor Miia Turpeinen**  
miia.turpeinen@oulu.fi

### **Future AI-tailored wireless hospital**

This theme is devoted to advanced digital solutions for clinical applications (diagnosis, treatment, and follow-up methods) in the future intelligent hospital, which are achieved through edge computing, machine learning, impact analysis, and health technology assessment techniques.

**Professor Jarmo Reponen**  
jarmo.reponen@oulu.fi

**Professor Johanna Uusimaa**  
johanna.uusimaa@oulu.fi

## 6GESS Energy themes

---

### **Sustainable energy systems empowering users with digital services**

Advanced digital solutions and 6G energy services that facilitate consumer participation and ensure enhanced energy security, quality, and reliability are addressed in this theme. The theme also connects energy system sustainability to climate and energy policies, focusing on climate neutrality.

**Professor Eva Pongracz**  
eva.pongracz@oulu.fi

**Associate Professor Hirley Alves**  
hirley.alves@oulu.fi

### **Energy efficiency of digitally enabled user-centric systems**

This theme is concerned with developing energy-efficient technologies and energy harvesting to eliminate the need for constant reliance on power lines or the charging and replacement of batteries. In line with the 6G Flagship research, the theme is linked to the development of eHealth sensor devices and data gathered from those devices.

**Assistant Professor Italo Atzeni**  
italo.atzeni@oulu.fi



## **Fibrobesity – Preventing Fibrosis Related to Obesity**

---

The Fibrobesity research programme (2021-2026) builds on Oulu's world-class expertise in hypoxia and extracellular matrix research to address the medical and societal challenges posed by obesity-related fibrotic pathologies, as part of the broader FibroHealth research umbrella.

Fibrobesity investigates new molecular mechanisms, biomedical disease modeling, and lifelong lifestyle factors to help prevent and treat fibrosis in complex chronic diseases, with a particular focus on the interplay between fibrosis and obesity. It also integrates historical, sociocultural, and behavioral insights into guidance for better management of obesity.

Fibrobesity is a collaborative effort across several faculties: Medicine, Biochemistry and Molecular Medicine, Information Technology and Electrical Engineering, Science, Technology, and Education and Psychology. Fibrobesity works closely with the Research Council of Finland, the Oulu University Hospital, and unique population cohort studies, including the Northern Finland Birth Cohorts.



## Contact Us

---

Professor, PhD, **Reetta Hinttala**, Leader Fibrobesity  
reetta.hinttala@oulu.fi

Professor, PhD, MD, **Juhani Junttila**, Vice Leader Fibrobesity  
juhani.junttila@oulu.fi

**Essi Erkkilä**, Coordinator  
essi.erkkila@oulu.fi

[oulu.fi/en/research/fibrohealth-combatting-fibrosis-chronic-diseases/fibrobesity](https://oulu.fi/en/research/fibrohealth-combatting-fibrosis-chronic-diseases/fibrobesity)





# Health Dimensions – Exploring the Complex Multidimensional Nature of Human Health

---

Health Dimensions research programme focuses on the fundamental causes of diseases and multimorbidity during the life-course and adds a new dimension towards the use of big data in building future health.

By uncovering the root causes of diseases and multimorbidity, and harnessing the power of big data, the programme aims to shape the future of health and social care in smarter, more sustainable ways.

## Contact Us

---

Professor **Eero Kajantie**, Health Dimensions leader  
eero.kajantie@oulu.fi

Professor **Johannes Kettunen**, Health Dimensions vice leader  
johannes.kettunen@oulu.fi

**Ritva Saastamoinen**, Health Dimensions coordinator  
ritva.saastamoinen@oulu.fi

[oulu.fi/en/health-dimensions](https://oulu.fi/en/health-dimensions)

Subscribe to our  
newsletter:



# Health Dimensions research themes

---

The four themes of Health Dimensions aspire to prevention of multimorbidity through a new level of understanding and acting on these dimensions: lifelong molecular, physiological, environmental, behavioural and societal mechanisms.

## Multidimensional mapping of health and diseases (HD1)

The first theme relies on multidimensional health data resources in large population samples of thousands to millions of individuals. The research seeks to understand why individuals age at different biological rates, and how some remain healthy into old age while others develop multiple chronic diseases much earlier.

**Associate professor Juulia Jylhävä, theme leader**  
juulia.jylhava@oulu.fi

## Longitudinal models of multimorbidity (HD2)

The longitudinal models will identify the patterns of multimorbidity at the earliest possible time to study the causal chains and propose early preventive strategies. The work utilises multi-source, longitudinal data to develop and implement models of early life course multimorbidity.

**Associate professor Katriina Heikkilä, theme leader**  
katriina.heikkila@oulu.fi

## Molecular level mechanistic validation (HD3)

Molecular-level mechanistic validation links fundamental mechanisms in preclinical models directly with extensive human datasets and lifelong cohorts. This bidirectional approach ensures that laboratory findings and large-scale epidemiological data constantly validate each other. The aim is to identify biological mechanisms and preventive targets for multimorbidity.

**Associate professor Keijo Viiri, theme leader**  
keijo.viiri@oulu.fi

## Clinical and societal implementation and ethical implications (HD4)

By tackling ethical and legal barriers, this theme integrates AI-driven predictive modelling into healthcare to assess its health, economic, and environmental impacts. This integration generates sustainable, lifelong care pathways to identify new high-risk groups and treat multimorbidity cost-effectively.

**Associate professor Markus Haapanen, theme leader**  
markus.haapanen@oulu.fi





## Oulu Brain & Mind

Oulu Brain & Mind (OBM) acts as a regional hub of Neurocenter Finland in Northern Finland, bringing together multidisciplinary expertise from neuroscience, clinical medicine, health sciences, technology, and social sciences. While Oulu is internationally known for its strengths in digital health and wireless solutions, OBM's network also spans areas such as brain disorders, mental health, rehabilitation, lifelong brain health, and population-level wellbeing.

By combining research, clinical practice, education, and innovation activities, OBM network aims to translate scientific knowledge into practical solutions that improve care, support prevention, and enhance quality of life. Through collaboration with regional, national, and international partners, OBM contributes to the development of holistic, human-centered approaches to brain health across the life course.



# Neurocenter Finland

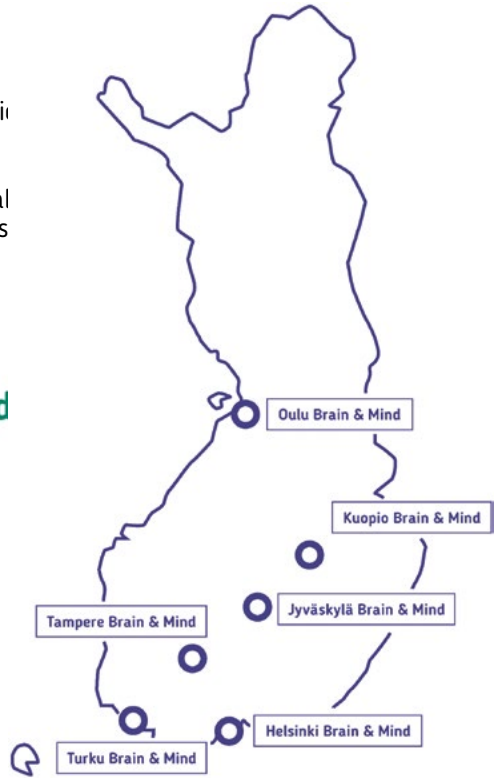
Neurocenter Finland is a national collaborative network connecting leading neuroscience research, healthcare, and innovation across Finland bringing together academia, hospital industry, and the third sector. Our mission is to promote brain health for all.



**Oulu Brain & Mind**  
Neurocenter Finland



**Neurocenter Finland**



## Contact Us

**Salla Kangas, Coordinator**  
salla.kangas@oulu.fi

**Mikael von und zu Fraunberg, Chair**  
mikael.fraunberg@pohde.fi



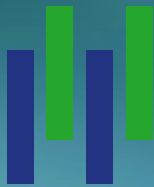
[neurocenterfinland.fi](https://neurocenterfinland.fi)



[oulu.fi/en/university/faculties-and-units/faculty-medicine/oulu-brain-mind](https://oulu.fi/en/university/faculties-and-units/faculty-medicine/oulu-brain-mind)



[linkedin.com/company/oulu-brain-mind](https://linkedin.com/company/oulu-brain-mind)



NORDIC CONFERENCE ON  
**Digital Health and  
Wireless Solutions**

[nordic-digihealth.com](http://nordic-digihealth.com)



In collaboration with



**Neurocenter Finland**  
Oulu Brain & Mind



**Pohde** Pohjois-Pohjanmaan  
hyvinvointialue