



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

**A leading hub for
technological innovation**

Nordic Conference on Digital Health and Wireless Solutions

**Hotel Lasaretti, Oulu, Finland
May 7-8, 2024**



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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 described 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, advanced methods are seen to enable more precise diagnostics and treatments using collected digital health data. 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 development of wireless technologies has brought healthcare services to users' mobile devices, allowing citizens to participate in their healthcare in unprecedented ways.

This Nordic Conference on Digital Health and Wireless Solutions (NCDHWS2024) is organized by the Digital Health (DigiHealth) and 6G Enabled Sustainable Solutions (6GESS) research programs at the University of Oulu. These programs bring together multidisciplinary research activities in medical and health sciences, health economics, information and sensor technology, as well as wireless communications. We have been supported by our collaborators North Ostrobothian Wellness Services County, Oulu University of Applied Sciences and OuluHealth. Our ambitious aim has been to organize for the first time an international multidisciplinary conference which provides an excellent opportunity for professionals, researchers, and industry leaders from different fields to discuss and 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 coverings wide range of multidisciplinary topics. Short descriptions of the talks are given in the following. We also have excellent scientific presentations divided into different thematic sessions, as shown in the following page. Part of the scientific presentations are presented as posters which are visible in p. 18.

Once again, warmly welcome to NCDHWS2024! We sincerely hope you enjoy this unique multidisciplinary conference!

On behalf of the NCDHWS2024 conference organisers



Jarmo Reponen
Conference President



Mariella Särestöniemi
Scientific Committee Chairperson

Program at a glance – Tuesday 7th May

Time	Track 1	Track 2	Track 3
08:30 09:30	Registration		
09:30 10:30	Session 1 Plenary: Digital Transformation in Health care Minister Kaisa Juuso, Keynote: Tomohiro Kuroda		
Coffee break, Exhibition and Posters			
11:00 12:30	Session 2a: Remote Care and Health Connectivity Architectures in 6G Era Invited talk: Flavio Esposito	Session 2b: User Experience and Citizen Data Invited talks: Christian Nøhr, Jeppe Eriksen	Session 2c: Digitalization in Health Education 1 Invited talks: Gillian Vesty, Helen Monkman
Lunch, Exhibition and Posters			
14:00 15:30	Session 3a: Digital Health Innovation Invited talks: Katri Kontio, Vivian Vimarlund	Session 3b: Digital Health Care Pathways 1 Invited talk: Rune Pedersen	Session 3c: Digitalization in Health Education 2 Invited talks: Sabine Koch, Kristina Mikkonen
Coffee break, Exhibition and Posters			
16:00 17:30	Session 4a: Clinical Decision Support and Medical AI 1 Invited talks: Elmar Kotter, Arild Faxvaag	Session 4b: Digital Health Care Pathways 2 Invited talk: Gudrun Audur Hardardottir	Session 4c: Novel Sensors and Bioinformatics Invited talks: Ilkka Korhonen, Joan Condell
19:30 23:30	Gala dinner in Lasaretti		

Practical Information

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, May 7th at 19:30 in Hotel Lasaretti's Aurora hall for those who have it included in the ticket price.

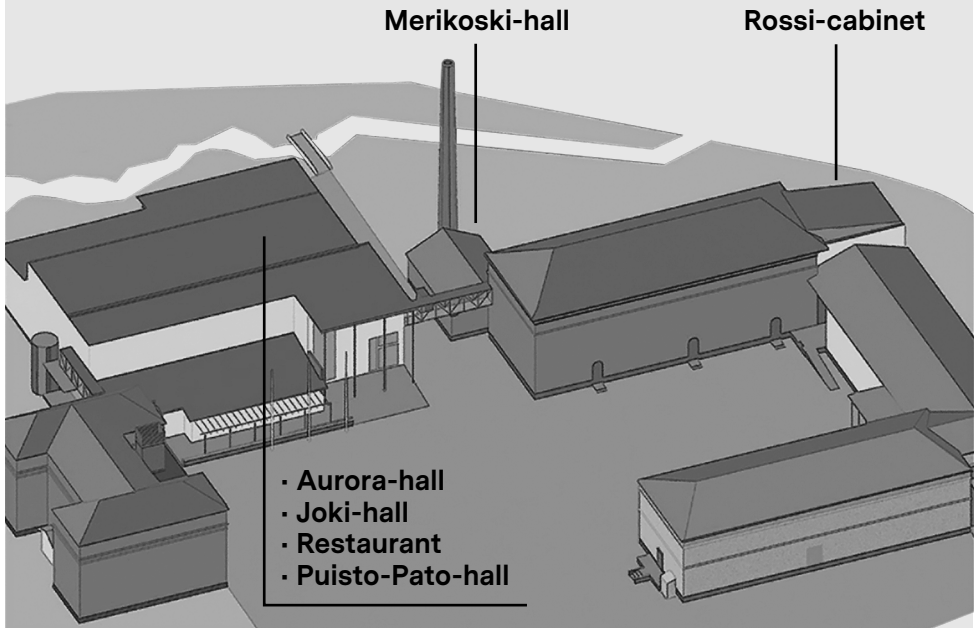
The detailed program is presented in this booklet, starting from page 10. Any updates or changes will be informed in the conference webpage which can be accessed with the QR code.



Program at a glance – Wednesday 8th May

Time	Track 1	Track 2	Track 3
	Site visits		
08:30 10:30	Future Hospital OYS2030, OYS TestLab and Knoppi, MITTLAB; Oulu University and OAMK, Oulu University Hospital, Accessible home (Mahdollistava Koti), OAMK, Nokia OTAVA Lab, Oulu University Health Tech Research Lab tours (1. Multimodal Sensing Lab, 2. UBICOMP Lab, 3. Human Body Twin Lab)		
Coffee break, Exhibition and Posters			
11:00 12:30	Session 5a: Clinical Decision Support and Medical AI 2 Invited talks: Claudia Lindner, Mika Nevalainen	Session 5b: HTA and Impact Evaluation Invited talks: Jochen Klucken, Janne Martikainen	Session 5c: Wireless technologies and Medical Devices Invited talk: Lorenzo Mucchi
Lunch, Exhibition and Posters			
14:00 15:30	Session 6 Plenary: Future of Digital Health Keynote: Michiel Sweerts, Invited talks: Pasi Eskola, Patricia Mechael		

Map of the conference venue



Speakers



Tomohiro Kuroda is Professor and director of Division of Medical Information Technology and Administrative Planning of Kyoto University Hospital, Japan. He is also director of the center for Digital Transformation of Healthcare as well as professor of medical informatics in the graduate school of medicine and the graduate school of informatics. His Keynote speech **“Current Status of Digitalization in Japanese Health Care”** presents transformative impact of digitalization on Japan’s healthcare system.



Flavio Esposito, Associate Professor from Saint Louis University, USA, will give a talk on **“Edge Computing Systems for Collaborative Healthcare Applications”**. The talk will provide insights on how edge computing can support and enhance a few healthcare applications by enabling real-time data processing to allow e.g., remote control of microscopes in telepathology and live processing of histological images.



Christian Nøhr, a Professor at Aalborg University, Denmark will give a talk titled **“User experience of health IT in the course of years in Denmark.”** In his enlightening session, he will delve into the evolution of health information technology (IT) within Denmark, focusing on the user perspective. Drawing from his extensive background in health informatics and user experience research, Professor Nøhr will explore how digital solutions over the years have shaped patient journeys and influenced healthcare practices in the Danish context.



Jeppe Eriksen, an Assistant Professor in the Department of Planning at the Aalborg University, Denmark, will give a talk on **“Digital health in the Nordic countries – the citizen perspective”**. His talk explores how digital health services impact citizens in the Nordic region, considering patient-reported outcomes and experiences. As an expert in health technology research, Eriksen’s insights shed light on the intersection of technology and citizen well-being.



Gillian Vesty, Professor and Deputy Dean L&T in the School of Accounting, Information Systems and Supply Chain at RMIT University, Melbourne, Australia, will give a talk titled **“Upskilling: Value-Based Healthcare Education with Serious Games”**. The talk explores innovative approaches to enhance healthcare education through serious games, emphasizing cost benefit modelling and budgeting principles for value-based healthcare.



Helen Monkman, Assistant Professor in the School of Health Information Science at the University of Victoria in British Columbia, Canada will give a talk on **“How do digital health literacy and other factors impact the use and understandability of consumer health information systems?”** Her talk will review some of the determinants and outcomes of digital health literacy which is a timely topic as health consumers are increasingly using digital tools to access health information.



Katri Kontio, a Regional Advisor in Health Information and Digital Health in the Pan American Health Organization will give a talk on **“Digital Health Adoption Journey in Low and Middle Income Countries: A Global Health Perspective”**. Her talk will delve into strategies for leveraging digital tools to bridge healthcare disparities, enhance surveillance, and improve outbreak data management in LMICs.



Vivian Vimarlund, Professor Emerita in Informatics at the Department of Computer and Information Science, School of Engineering and Technology, in Linköping University, Sweden will give a talk on **“Challenges for measuring the impacts of e-Health innovations.”** Besides of given comprehensive overview on the challenges associated with measuring the impacts of e-Health innovations, she will explore topics such as evaluating the effectiveness of eHealth solutions, and creating innovative business models.



Rune Pedersen, a department manager and senior researcher at Norwegian Centre for E-health Research as well as an Associate Professor in the UiT Arctic University of Norway, will give a talk **“Information Systems Supporting Digital Health Care Pathways and Fluent Patient Journeys”**. In his talk, he will explore how leveraging interoperable electronic health record (EHR) systems can enhance patient experiences, streamline care pathways, and create seamless journeys for individuals seeking healthcare services.



Sabine Koch, is Strategic Professor of Health Informatics at Karolinska Institutet and Director of Health Informatics Centre at the LIME, Sweden. She will give a talk on **“Capacity building in digital health – how to educate professionals and citizens”**. Due to her versatile expertise and as a former President of the International Medical Informatics Association (IMIA), she brings valuable insights in educating both professionals and citizens about digital health.



Kristina Mikkonen is a professor of health sciences leading a research group called Healthcare Education and Competence, and is one of the key initiatives in the Hybrid Intelligence Profile of the University of Oulu. She will give a talk titled **“What New Skills Do We Need in Digital Health - the Role of VR and AI in Education?”** which will challenge traditional thinking and propose innovative methods to integrate virtual reality and artificial intelligence into healthcare education and public health initiatives.



Elmar Kötter is Professor and the Head of Imaging Informatics in the Department of Radiology at Freiburg University Medical Center in Germany and an Associate Professor of Radiology at Freiburg University. He will give a talk on **“Medical AI and Clinical Decision Support in Radiology”** which delves into the intersection of artificial intelligence (AI) and radiology. He will discuss the impact of clinical decision support systems, current practices, challenges, legal considerations, and the future role of radiologists in an AI-driven landscape.

Speakers



Arild Faxvaag, a professor in Health Informatics at the Norwegian University of Science and Technology (NTNU), will deliver an invited talk titled **“How can IT solutions help professionals deliver knowledge-based care?”** In this talk, he will explore how leveraging information technology can empower health professionals to provide effective, equitable, and sustainable care based on sound knowledge and insights.



Gudrun Hardardottir, Project Manager at the National Centre for eHealth in Iceland, will give a talk on **“Experiences in building a national digital health platform”**. Her talk delves into challenges, successes, and insights gained from creating a comprehensive digital health infrastructure at a national level. Additionally, her talk covers also practical aspects and user experiences related to ePrescription systems, the National Citizen Health Portal, and the National Electronic Health Record.



Ilkka Korhonen, Adjunct Professor in Faculty of Biomedicine and Health, Tampere University, Finland, and Software Engineering Manager in Parameters & Wearables organization at GE HealthCare Finland, will give a talk with a title **“Wearable sensors for improving health monitoring inside and outside the hospital”**. The talk will cover the evolution of wearable sensors, their potential in the future and real-world applications in health monitoring both inside and outside the hospital.



Joan Condell is Professor in the Intelligent Systems Research Centre at the Ulster University, Northern Ireland. She is also a senior fellow of the Centre for Higher Education Research and Practice at Ulster and a fellow of the Higher Education Academy. She will give a talk on **“Wearable sensors and applications in healthcare”** which explores the integration of wearable sensor technologies in community healthcare, highlighting advancements and applications that enhance patient monitoring and diagnostics.



Claudia Lindner, Sir Henry Dale Fellow and Senior Research Fellow in the Division of Informatics, Imaging & Data Sciences at the University of Manchester, will give a talk on **“AI-Based Medical Image Analysis in Musculoskeletal Disorders”**. The talk delves into the clinical applications of artificial intelligence (AI) in the field of musculoskeletal imaging, including discussions covering various musculoskeletal disorders.



Mika Nevalainen, Assoc. Professor of Radiology and fellowship-trained musculoskeletal radiologist at University of Oulu and Oulu University Hospital, will give a talk on **“How close are we in implementation of AI in everyday radiology in Finland”**. The talk will give insights on the current stage of AI implementation to radiologic practice in Finland. Emphasis will be put on DL-based MR image reconstruction methods and on practical utility of image interpretation software deployed at the moment in the hospital environment.



Jochen Klucken, MD is Professor and neurologist, neuroscientist, and the FNR-PEARL Chair of Digital Medicine and head of the Digital Medicine research group at the LCSB of the University of Luxembourg, the LIH and the CHL. He will give a talk on ***“New Evidence for Digital Medical Devices – for developers and assessors”*** which explores the latest advancements of linking clinical evidence for the value generated by digital medical devices with their market access and reimbursement strategies in Europe.



Janne Martikainen, the health economist and professor of pharmacoeconomics at the University of Eastern Finland, will give a talk on ***“Impact Assessment and Health Technology Assessment (HTA) in Digital Health”***. The talk will provide insights on the systematic evaluation of health technologies through HTA emphasizing the importance of assessing the properties, effects, and impacts of digital health technologies to inform decision-makers and facilitate their effective integration into healthcare systems.



Lorenzo Mucchi, Associate Professor from University of Florence, Italy, will give a talk on ***“New wireless technologies for health and EU standardization on body area networks”***. Furthermore, he will explain best practices and role of ICTs on telemanagement of fragile citizens in Italy, including view for future healthcare system.



Michiel Sweerts is Head of Research Sector for eHealth, Well-Being and Ageing at Directorate-General Communications Networks, Content and Technology in European Commission. His Keynote talk will discuss ***current EU policies and research initiatives on Digital health***. EU supports advancement of Digital health through EU level regulatory frameworks, investments in the deployment of digital health infrastructures under the DIGITAL Europe programme and through research funding under Horizon Europe programme.



Pasi Eskola serves as the Chief Medical Administrator at the Wellbeing Services County of North Ostrobothnia and as an Assistant Professor at the University of Oulu. His talk: ***“Northern Ostrobothnian Welfare Services County, Oulu University Hospital, Finnish pioneer in strategic digitalization of healthcare”*** explores digital transformations in healthcare led by North Ostrobothnia and Oulu University, highlighting unique regional characteristics that foster innovative digital integration, enhancing efficiency in healthcare.



Patricia Mechael, a senior researcher in John Hopkins University, USA, and her co-author **Lena Kan** will give a talk on ***“Digital Health Exemplars Study of Primary Health Care Digital Transformation: Preliminary Results from Finland.”*** The talk discusses initial findings in evaluating the role of digital health within primary healthcare in Finland providing insights from a scoping review on digital health implementation, equity considerations, and an impact analysis plan for MyKanta.

Detailed program

Tuesday 7.5.2024

- 8:30-9:30 **Registration**
- 9:30-10:30 **Session 1 – Digital Transformation in Healthcare, Chair: Jarmo Reponen**
- 9:30-9:40 **Conference opening words** Conference president Prof. Jarmo Reponen, University of Oulu
- 9:40-9:50 **Greetings from Finnish Ministry of Social Affairs and Health:** Minister of Social Affairs and Health Kaisa Juuso
- 9:50-10:20 **Keynote: Current Status of Digitalization in Japanese Health Care** Prof. Tomohiro Kuroda, Kyoto University, Japan
- 10.20-11:00 **Coffee, Exhibition and Posters**
- PARALLEL SESSIONS**
- 11:00-12:30 **Session 2a – Remote Care and Health Connectivity Architectures in 6G Era, Chair: Erkki Harjula**
- Invited Speech:**
- 11:00-11:20 **Edge Computing Systems for Collaborative Healthcare Application** Assoc. Prof. Flavio Esposito, Saint Louis University, USA
- Scientific Presentations:**
- 11:20 **Expert Perspectives on Future 6G-Enabled Hospital Metaverse** Fan Wang, Risto Jurva, Petri Ahokangas, Seppo Yrjölä, Marja Matinmikko-Blue
- 11:27 **An LSTM Framework for the Effective Screening of Dementia for Deployment on Edge Devices** Bernard Wilkie, Karla Munoz Esquivel, Jamie Roche
- 11:34 **Adaptive Security in 6G for Sustainable Healthcare** Ijaz Ahmad, Ijaz Ahmad, Erkki Harjula
- 11:41 **Decentralized Pub/Sub Architecture for Real-time Remote Patient Monitoring: a Feasibility Study** Kazi Nymul Haque, Johirul Islam, Ijaz Ahmad, Erkki Harjula
- 11:48 **Towards 6G technology enabled wearable patient monitoring – a pilot study in radiotherapy treatment pathway** Teemu Myllylä, Sakari S. Karhula, Daljeet Singh, Jesse Lohela, Sadegh Moradi, Kalle Inget, Vesa Korhonen, Mariella Särestöniemi, Jarmo Reponen, Risto Jurva, Tuomo Hänninen, Olli Liinamaa, Erkki Harjula, Juha Nikkinen
- 11:55 **Preliminary Study on Wellbeing and Healthcare Services Needs in Japan and Finland for Telehealth Solutions Based on Dwelling** Jaakko Hyry, Pasi Karppinen, Takumi Kobayashi, Daisuke Anzai
- 12:02 **Considering the potential use of Oura ring for remote monitoring at home: the perspective of ageing neurological patients** Melika Azim Zadegan, Rosa Sahlström, Eeva Aromaa, Tero Montonen, Päivi M Eriksson, Ville Leinonen
- 12:09-12:14 **Exhibitor presentations: NGK Europe GmbH**

11:00-12:30 **Session 2b – User Experience and Citizen Data, Chair: Jarmo Reponen**

Invited Speeches:

- 11:00 **User experience of health IT in the course of years in Denmark** Prof. Christian Nøhr, Aalborg University, Denmark
- 11:20 **Digital health in the Nordic countries – the citizen perspective** Assist. Prof. Jeppe Eriksen, Aalborg University, Denmark

Scientific Presentations:

- 11:40 **Dynamics in Entry and Exit Registrations in a 14-year Follow-up of Nationwide Healthcare HIE and EHR Systems: Electronic Prescription and Patient Data Repository Services 2010–2023 in Finland** Vesa Jormanainen
- 11:47 **Closing the Loop for Controlled Substances Surveillance: A Field Study of the Usability and User Experience of an Integrated Electronic Narcotic Consumption** Annika Häkkinen, Johanna Viitanen, Kaisa Savolainen, Ville-Matti Mäkinen, Mia Sivén, Tinja Lääveri, Hanna M. Tolonen
- 11:54 **A User-Centric Exploration of a Digital Health Experience** Milka Haanpää, Salla Saraniemi
- 12:01 **Fatigue Assessment with Visualizations of Patient-Generated Data: An Evaluation with Informatics-Savvy Healthcare Professionals** Sharon Guardado, Terhi Holappa, Minna Isomursu
- 12:08 **Older Adults' Emotional User Experiences with Digital Health Services** Paula Valkonen, Sari Kujala
- 12:15 **The Adoption of MyData-Based Health Applications Among Elderly Citizens in Nordic Countries and the UK** Chathurangani Jayathilake, Pantea Keikkhosrokiani, Minna Isomursu

12:22-12:27 **Exhibitor presentations: ESKO Systems**

11:00-12:30 **Session 2c – Digitalization in Health education 1, Chair: Miia Jansson**

Invited Speeches:

- 11:00 **Upskilling: Value-Based Healthcare Education with Serious Games** Assoc. Prof. Gillian Vesty, RMIT University, Melbourne, Australia
- 11:20 **How do digital health literacy and other factors impact the use and understandability of consumer health information systems?** Assist. Prof. Helen Monkman, University of Victoria, Canada

Scientific Presentations:

- 11:40 **Intergenerational Learning and Managerial Approaches for Fostering Digital Competence in Health care – A qualitative study** Mira Hammarén, Tarja Maarit Pölkki, Outi Kanste
- 11:47 **Healthcare professionals' digital competence in healthcare settings – an international comparative study** Erika Jarva, Anne Oikarinen, Boris Miha Kaučič, Zhou Wentao, Miyae Yamaka-wa
- 11:54 **Developing National Medical and Dental Education: From Digital Leap to Digital Marathon** Tiina Salmijärvi, Petri Kulmala, Henri Takalo-Kastari, Jarmo Reponen
- 12:01 **Initial Experiences of Electronic Medical Record Simulation Environment in eHealth Education in Finland** Petra Kuikka, Paula Veikkolainen, Tiina Salmijärvi, Timo Tuovinen, Petri Kulmala, Jarmo Reponen
- 12:08 **Health care professionals' perceptions of digital counselling – A qualitative descriptive study** Juulia Kaihlaniemi, Maria Kääriäinen, Anne Oikarinen
- 12:15-12:22 **How does human-centred extended reality support healthcare students' learning in clinical conditions?** Kristina Mikkonen, Hany Ferdinando, Marta Sobocinski, Heli Kuivila, Sari Pramila-Savukoski, Tugba Whitehead, Paula Ropponen, Teemu Myllylä, Jari Paunonen, Erson Halili, Joel Koutonen, Juha-Matti Taikina-Aho, Antti Siipo, Sanna Järvelä

12:30-14:00 **Lunch, Exhibition and Posters**

14:00-15:30 **Session 3a – Digital Health Innovation, Chair: Mark van Gils**

Invited Speeches:

14:00 **Digital Health Adoption Journey in Low and Middle Income Countries: A Global Health Perspective** Katri Kontio, Regional Advisor in Health Information and Digital Health in the Pan American Health Organization, USA

14:20 **Challenges for measuring the impacts of e-Health innovations** Emerita Professor Vivian Vimarlund, Linköping University, Sweden

Scientific Presentations:

14:40 **Digital Health Exemplars: Service Delivery Transformation through Digital Innovation** Lena Kan, Patricia Mechael, Smisha Agarwal, Shivani Pandya, Binyam Tilahun

14:47 **Digital Empathic Healthcare: Designing Virtual Interactions for Human-Centered Experiences** Amy Grech, Andrew Wodehouse, Ross Brisco

14:54 **Developing a Digital Gaming Intervention with Yetitablet® to Improve Older People's Functioning and Activity in Long-Term-Care – a Feasibility Study**

Saara Kukkohovi, Heidi Siira, Satu Elo

15:01 **Orchestrating customer-oriented private-public health care ecosystem** Satu Nätti, Hanna Komulainen, Saira Saraniemi, Pauliina Ulkuniemi

15:08 **Digital twins for development of microwave-based brain tumor detection** Mariella Särestöniemi, Daljeet Singh, Charline Heredia, Juha Nikkinen, Mikael von und zu Fraunberg, Teemu Myllylä

15:15-15:20 **Exhibitor presentations: MedaNets**

14:00-15:30 **Session 3b – Digital Health Care Pathways 1, Chair: Johanna Uusimaa**

Invited Speeches:

14:00 **Information Systems Supporting Digital Health Care Pathways and Fluent Patient Journeys**

Assoc. Prof. Rune Pedersen, UiT Arctic University of Norway; Norwegian Centre for E-health Research, Norway

Scientific Presentations:

14:20 **The Role of Digital Epilepsy Care Pathway on Patients' Treatment Burden: Clinicians' Perspective** Manria Polus, Pantea Keikhosrokiani, Johanna Uusimaa, Jonna Komulainen-Ebrahim, Johanna Annunen, Sehrish Khan, Woubshet Behutiye, Päivi Vieira, Minna Isomursu

14:27 **Design Sustainability Goals for digital care pathway for epilepsy: A Healthcare Professionals Perspective** Sehrish Khan, Pantea Keikhosrokiani, Johanna Uusimaa, Johanna Annunen, Jonna Komulainen-Ebrahim, Manria Polus, Päivi Vieira, Minna Isomursu

14:34 **Enhancing Independent Auditory and Speechreading Training – Two Finnish Free Mobile Applications Constructed for Deaf and Hard of Hearing Children and Adults** Kerttu Huttunen, Jaakko Kauramäki, Kati Pajo, Satu Saalasti

14:41 **Visual Modeling of Multiple Sclerosis Patient Pathways: The Healthcare Workers' Perspectives** Binyam Bogale, Ingrid Konstanse Ledel Solem, Elisabeth Gulowsen Cellius1, Ragnhild Halvorsrud

14:48 **Use of digital technologies in nursing homes at a rural area of Northern Finland** Pekka Kilpeläinen, Meira Mankinen, Veijo Sutinen and Vesa Virtanen

14:55 **Developing opportunities with digital transformation challenges in hospital at home services** Terhi-Maija Isakov, Henna Härkönen, Piia Hyvämäki and Miia Jansson on behalf of the research group

- 15:02 **Robots in the Care of Older People: Robot Literacy Required** Päivi Rasi-Heikkinen, Susanna Rivinen, Aino Ahtinen
- 15:09 **Informal Carers of People with MS Viewpoint in Digital Health Research: a Scoping Review** Tiia Yrttiaho, Vasiliki Mylonopoulou, Guido Giunti, Minna Isomursu
- 15:16-15:21 **Exhibitor presentations:** Iiwari Tracking Solutions and Hola 5G
- 14:00-15:30 **Session 3c – Digitalization in Health education 2, Chair: Petri Kulmala**
- Invited Speeches:**
- 14:00 **Capacity building in digital health – how to educate professionals and citizens?**
Prof. Sabine Koch, Karolinska Institutet, Sweden
- 14:20 **What new skills we need in digital health - the role of VR and AI in education?**
Prof. Kristina Mikkonen, University of Oulu, Finland
- Scientific Presentations:**
- 14:40 **Factors affecting marginalized older peoples’ digital exclusion evaluated by gerontological social work professionals** Virpi Paananen, Susanna Rivinen, Anniina Tohmola, Satu Elo
- 14:47 **The needed skills and competencies for healthcare providers to use technology for patients with pain** Johanna Soini, Héctor Beltrán-Alacreu, Asuncion Ferri-Morales, Ingrid Jepsen, Andrea Kuckert, Katriina Kihalampi, Andreas Künz, Anna Marie Lassen, Cristina Lirio-Romero, Sanna Luoma-aho, Daniel Ramskov Jørgensen, Diana Schack Thoft, Diego Serrano-Muñoz, Alison Themessl-Huber, Tobias Werner
- 14:54 **Social and health teachers’ experiences of implementing multidisciplinary specialisation studies in a digital learning environment** Hanna Naakka, Jarmo Heinonen, Sami Perälä, Anna Rauha, Mika Paldanius, Outi Ahonen, Päivi Sanerma
- 15:01 **Supporting sense of meaningful life and human dignity in digitally assisted physiotherapy environment – qualitative secondary research with thematic analyses and inductive synthesis** Tuulikki Sjögren, Hilikka Korpi
- 15:08-15:15 **Patients’ experiences of the digital counselling competence of healthcare professionals – A qualitative descriptive study** Petra Suonnansalo, Juulia Kaihlaniemi, Outi Kähkönen, Anne Oikarinen
- 15:15-16:00 **Coffee break and Poster Tour in Rossi cabinet**

16:00-17:30 **Session 4a – Clinical Decision Support and Medical AI 1, Chair: Daljeet Singh**

Invited Speeches:

- 16:00 **Medical AI and Clinical Decision Support in Radiology** Prof. Elmar Kotter, Freiburg University Medical Center, Germany
- 16:20 **How can IT solutions help professionals to deliver knowledge based care?** Prof. Arild Faxvaag, Norwegian University of Science and Technology, Norway

Scientific Presentations:

- 16:40 **Using machine learning methods to predict the lactate trend of sepsis patients in the ICU** Mustafa Kemal Arslantas, Tunc Asuroglu, Reyhan Arslantas, Emin Pashazade, Pelin Corman Dincer, Gulbin Tore Altun, Alper Kararmaz
- 16:47 **Pipeline for Automatic Brain Stimulation with Real-time Machine-learning -based Decoding of EEG Responses** Matilda Makkonen, Olli-Pekka Kahilakoski, Kyösti Alkio, Ivan Zubarev, Risto Juhani Ilmoniemi, Tuomas Petteri Mutanen, Pantelis Lioumis
- 16:54 **Computed tomography artefact detection using deep learning — towards automated quality assurance** Satu Inkinen, Antti Kotiaho, Matti Hanni, Miika T. Nieminen, Mikael Brix
- 17:01 **Early Prediction of Memory Disorders Using Primary Healthcare and Social Services Data** Heba Sourkatti, Tunc Asuroglu, Aino-Lotta Ilona Alahäivälä, Anna-Maija Tolppanen, Jouni Ihalainen
- 17:08 **Assessment of Parkinson's Disease Severity Using Gait Data: A Deep Learning-Based Multimodal Approach** Nabid Faiem, Tunc Asuroglu, Koray Açıcı, Antti Kallonen, Mark van Gils
- 17:15-17:22 **Developing a Patient Safety CDSS Platform using Healthcare MyData** Wona Choi, Sung goo You, Dai-Jin Kim, In Young Choi

16:00-17:30 **Session 4b – Digital Health Care Pathways 2, Chair: Pantea Keikhosrokiani**

Invited Speech:

- 16:00 **Experiences in building a national digital health platform** Gudrun Audur Hardardottir, National Centre for eHealth, Iceland

Scientific Presentations:

- 16:20 **Dual-perspective Modeling of Patient Pathways: A Case Study on Kidney Cancer** Anna Grøndahl Larsen, Ragnhild Halvorsrud, Rolf Eigil Berg, Märt Vesinurm
- 16:27 **Parental Views on the Digital Solution for Children's Day Surgery Pathway** Arja Rantala, Miia Jansson, Otto Helve, Pella Lahdenne, Minna Pikkarainen, Tarja Pöikki
- 16:34 **Digital Services in the Welfare, Social and Health Sector Organizations of the South Ostrobothnia Region** Merja Hoffren-Mikkola
- 16:41 **Community Health Workers' Experiences of a Digital Solution for Community-based Rehabilitation in Primary Healthcare** Michael Oduor, Eeva Aartolahti, Juliette Gasana, Hilmi Zadah Faidullah, David Tumusime, Katariina Korniloff
- 16:48 **A Persuasive mHealth Application for Postoperative Cardiac Procedures: Prototype Design and Usability Study** Renata Savian Colvero de Oliveira, Grace Dal Sasso, Sriram Iyengar, Harri Oinas-Kukkonen
- 16:55 **Patient and Healthcare Professional Experiences on the Barriers, Facilitators, and Solutions of Digital Counseling Materials for Patients with Cerebrovascular Diseases** Kirsi Myllykangas, Henna Härkönen, Maria Kääriäinen, Mikko Kärppä, Miia Jansson
- 17:02 **Effectiveness of Robot-assisted Lower Limb Rehabilitation on Balance in People with Stroke: A Systematic Review, Meta-analysis, and Meta-regression** Riku Ylikkela, Aki Rintala, Anna Köyhäjoki, Harto Hakonen, Hilikka Korpi, Mirjami Kantola, Sari Honkanen, Outi Ilves, Tuulikki Sjögren, Juha Karvanen, Eeva Aartolahti
- 17:09-17:16 **Virtual Reality in Rehabilitation of Executive Functions in Children (VREALFUN)** Merja Nikula, Mirjami Mäntymaa, Steven M. Lavalle, Ari Pouttu, Julia Jaekel, Eeva T. Aronen, Tytti Pokka, Juha Salmi, Johanna Uusimaa

16:00-17:30 **Session 4c – Novel Sensors and Bioinformatics, Chair: Mariella Särestöniemi**

Invited Speeches:

- 16:00 **Wearable sensors for improving health monitoring inside and outside the hospital** Adj. Prof. Ilkka Korhonen, Tampere University, Finland
- 16:20 **Wearable sensors and applications in healthcare** Prof. Joan Condell, Ulster University, Ireland

Scientific Presentations:

- 16:40 **A Distributed Framework for Remote Multimodal Biosignal Acquisition and Analysis** Constantino Alvarez Casado, Pauli Räsänen, Le Ngu Nguyen, Arttu Lämsä, Johannes Peltola, Miguel Bordallo Lopez
- 16:47 **Passively Reconfigurable Antenna using Gravitational Method** Thanatcha Satitchantrakul, Chanathan Manapreecha, Sukrit Phongpatrawiset, and Ping Jack Soh
- 16:54 **Monte Carlo Simulation of Implanted Intracranial fNIRS** Netaniel Rein, Mordekhay Medvedovsky, Michal Balberg
- 17:01 **Enabling Rapid Multi-locus Transcranial Magnetic Stimulation with Pulse-width Modulation** Heikki Sinisalo, Mikael Laine, Jaakko O. Nieminen, Victor H. Souza, Matti Stenroos, Renan H Matsuda, Ana M. Soto, Elena Ukharova, Tuomas Petteri Mutanen, Lari M. Koponen, Risto Juhani Ilmoniemi
- 17:08 **A Skewness-based Harmonic Filter for Harmonic Attenuation of Wearable Functional Near-infrared Spectroscopy Signals** Hany Ferdinando, Martti Ilvesmäki, Janne Kananen, Sadegh Moradi, Teemu Myllylä
- 17:15 **Wearable Motion Sensors in the Detection of ADHD: A Critical Review** Jakov Basic, Johanna Uusimaa, Juha Salmi
- 17:22-17:29 **Influence of Arterial Vessel Diameter and Blood Viscosity on PTT in Pulsatile Flow Model** Aleksandra Zienkiewicz, Erkki Vihriälä, Teemu Myllylä
- 19:30 **Gala dinner at Aurora hall of Hotel Lasaretti** (for those who have it included in the ticket price)

Detailed program

Wednesday 8.5.2024

8.00-08.30 **Bus transportation from hotels to site visits**

8.30-10.30 **Site Visits**

- Future Hospital OYS2030
- OYS TestLab and Knoppi
- MITTLAB; Oulu University and OAMK, Oulu University Hospital
- Accessible home (Mahdollistava Koti), OAMK
- Nokia OTAVA Lab.
- Oulu University Health Tech Research Lab tours (1) Multimodal Sensing Lab, 2) UBICOMP Lab, 3) Human Body Twin Lab)

For details, please see conference website and separate information

Bus transportation from site visits to Lasaretti

10:30-11:00 **Coffee, Exhibition and Posters**

PARALLEL SESSIONS

11:00-12:30 **Session 5a – Clinical Decision Support and Medical AI 2, Chair: Mikael Brix**

Invited Speech:

11:00 **AI-Based Medical Image Analysis in Musculoskeletal Disorders** Dr. Claudia Lindner, University of Manchester, UK

11:20 **How close are we in implementing AI in everyday radiology?** Assoc. Prof. Mika Nevalainen, Oulu University Hospital, Oulu

Scientific Presentations:

11:40 **Drug Recommendation System for Healthcare Professionals' Decision-Making using Opinion Mining and Machine Learning** Pantea Keikhosrokiani, Katheeravan Balasubramaniam, Minna Isomursu

11:47 **Enhancing Arrhythmia Diagnosis with Data-Driven Methods: A 12-Lead ECG-Based Explainable AI Model** Emmanuel C. Chukwu, Pedro A. Moreno-Sánchez

11:54 **Real-time Gait Anomaly Detection using 1D-CNN and LSTM** Jakob Rostovski, Mohammad Hasan Ahmadilivani, Andrei Krivošei, Alar Kuusik, Muhammad Mahtab Alam

12:01 **Research for JYU: An AI-driven, Fully Remote Mobile Application for Functional Exercise Testing** Neil Cronin, Ari Lehtiö, Jussi Talaskivi

12:08 **Exploring and Extending Human-Centered Design to Develop AI-enabled Wellbeing Technology in Healthcare** Laura Tahvanainen, Outi Ahonen, Birgitta Tetri

12:15-12:22 **A Hybrid Images Deep Trained Feature Extraction and Ensemble Learning Models for Classification of Multi Disease in Fundus Images** Jyoti Verma, Isha Kansal, Renu Popli, Vikas Khullar, Daljeet Singh, Manish Snehi, Rajeev Kumar

11:00-12:30 **Session 5b – Health Technology Assessment and Impact Evaluation, Chair: Mark van Gils**

Invited Speeches:

11:00 **New Evidence for Digital Medical Devices – for developers and assessors** Prof. Jochen Klucken, University of Luxembourg, Luxembourg Institute of Health and Centre Hospitalier de Luxembourg, Luxembourg

11:20 **Impact Assessment and Health Technology Assessment in Digital Health** Prof. Janne Martikainen, Head of UEF House of Effectiveness, University of Eastern Finland, Finland

Scientific presentations:

11:40 **Finnish Digi-HTA Assessment Model for Digital Health and an International Comparison** Jari Haverinen, Jarno Suominen, Rauli Kaksonen, Paula Veikkolainen, Merja Voutilainen, Jarmo Reponen, Juha Röning, Petra Falkenbach

11:47 **Impact of Digital Services on Healthcare Performance -an Umbrella Review** Henna Härkönen, Sanna Lakoma and Miia Jansson, on behalf of the research group

11:54 **Influencing Factors in Digital Health Intervention Uptake: The Interplay of Education, Lifestyle, and Digital Literacy** Ilona Ruotsalainen, Mikko Valtanen, Riikka Kärsämä, Adil Umer, Suvi Parikka, Annamari Lundqvist, Jaana Lindström

12:01 **A mobile application as an alternative to the traditional preparation method for parents in pediatric day surgery: A randomized controlled trial** Heli Kerimaa, Marianne Haapea, Mervi Hakala, Willy Serlo, Tarja Pölkki

12:08 **Effect of Digital Therapeutics based on Cognitive Behavioral Treatment for Alcohol Use Disorder: Exploratory Clinical Study** Ji-Won Chun, Wona Choi, In Young Choi, Dai-Jin Kim

12:16-12.23 **Exhibitor presentations: Nucu**

1:00-12:30 **Session 5c – Wireless Technologies and Medical Devices, Chair: Erkki Harjula**

Invited Speech:

11:00 **Empowering Healthcare: Standardization, Wireless Technologies, and Best Practices** Assoc. Prof. Lorenzo Mucchi, University of Florence, Italy

Scientific Presentations:

11:20 **Microwave technique based Noninvasive Monitoring of Intracranial Pressure using Realistic Phantom Models** Daljeet Singh, Erkki Vihriälä, Mariella Särestöniemi, Teemu Myllylä

11:27 **Securing Hybrid Wireless Body Area Networks (HyWBAN): Advancements in Semantic Communications and Jamming Techniques** Simone Soderi, Mariella Särestöniemi, Syifaul Fuada, Matti Hämäläinen, Marcos Katz, Jari Iinatti

11:34 **Optical Wireless Power Transmission Through Biological Tissue using Commercial Photovoltaic Cells under 810 nm LEDs: Feasibility Study** Syifaul Fuada, Mariella Särestöniemi, Malalgodage Amila Nilantha Perera, Marcos Katz

11: 41 **Method to Monitor Cough by Employing Piezoelectric Energy Harvesting Configurations** Jaakko Palosaari, Eetu Virta, Miika Miinala, Yang Bai

11:48 **Detection of Intestinal Tumors Outside the Visibility of Capsule Endoscopy Camera Utilizing Radio signal recognition** Mariella Särestöniemi, Attaphongse Taparugsanakorn, Jari Iinatti, Teemu Myllylä

11:55 **Towards Remote 3D Pathological Diagnosis System Using LUCID, a Tissue-Clearing Reagent, and HandySPIM, a Novel Compact 3D Imaging Device** Hiroshi Onodera, Kenji Uehara, Takumi Murakami, Asami Tanaka, Yusuke Morishita, Junji Yumoto

12:02 **Inter- and Intra-Day Precision of Cheap and Wearable Bioelectrical Impedance Analysis Device** Leon Robertz, Lassi Rieppo, Seppo Korkala, Tommi Jaako, Simo Saarakkala

12:09-12:14 **Exhibitor presentations: PLM Group**

12:30-14:00 **Lunch, Exhibition and Posters**

14:00-15:30 **Closing Plenary – Future of Digital Health, Chair: Simo Saarakkala**

Keynote:

14:00 **EU policies and research initiatives on Digital health** Michiel Sweerts, Head of Sector, Research, CNECT.DDG1.H.3 – eHealth, Well-Being and Ageing, European Commission

Invited Speeches:

14:30 **Northern Ostrobothnian Welfare Services County, Oulu University Hospital, Finnish pioneer in strategic digitalization of healthcare** Pasi Eskola, Chief Medical Administrator, Wellbeing Services County of North Ostrobothnia, Assistant Professor, General Practice and Family Medicine, University of Oulu

14:50 **Digital Health Exemplars Study of Primary Health Care Digital Transformation: Preliminary Results from Finland** Senior Associate Patricia Mechael and Research Associate Lena Kan, John Hopkins University, USA

15:10 **Best Paper Awards**, Distributed by Mariella Särestöniemi, scientific committee chairperson

15:25 **Closing words** Conference Vice-President, Prof. Simo Saarakkala, University of Oulu, Finland

Poster exhibitions are open during all breaks:

- 1. Measurement applications of smartphone with extended optical capability** Jarmo Hietanen
- 2. Legitimacy challenges of MyData Approach to Personal Data Management within the Context of GDPR implementation** Aigerim Dairabekova
- 3. The effects of robotic training on walking and functional independence of people with spinal cord injury: a systematic review, meta-analysis and meta-regression** Anna Köyhäjoki, Hilikka Korpi, Riku Ylilikkela, Harto Hakonen, Mirjami Kantola, Aki Rintala, Sari Honkanen, Outi Ilves, Tuulikki Sjögren, Juha Karvanen, Eeva Aartolahti
- 4. Hybrid Intelligence – Human-AI co-evolution and learning in multirealities (HI)** Sanna Järvelä, Guuying Zhao, Janne Heikkilä, Hanna Järvenoja, Kristina Mikkonen, Satu Kaleva
- 5. Navigating the Intensive Care Dilemma: Striking a Harmonious Balance in AI Automation** Irina Atkova, Miia Jansson, Petri Ahokangas, Henna Härkönen, Gillian Vesty
- 6. A mobile application intervention helps alleviate preschool children's fear in the entire day surgery service chain** Heli Kerimaa, Mervi Hakala, Marianne Haapea, Hannu Vähänikkilä, Willy Serlo and Tarja Pölkki
- 7. Experimental Study of In-body Devices Misalignment Impact on Light-based in-body Communication** Syifaul Fuada, Mariella Särestöniemi, Marcos Katz, Matti Hämäläinen, Simone Soderi, Matti Hämäläinen
- 8. Study on Fat as the Propagation Medium in Optical-based In-body Communications** Syifaul Fuada, Mariella Särestöniemi, Simone Soderi, Marcos Katz, Matti Hämäläinen
- 9. Patients' experiences of healthcare professionals' competence in digital counselling in healthcare settings – A qualitative systematic literature review** Juulia Kaihlaniemi, Petra Suonnansalo, Anne Oikarinen
- 10. Neonatal procedural pain management using digital solutions – a study protocol of a randomized controlled trial with crossover design** Anna-Kajja Palomaa, Sadegh Moradi, Seppälä Eveliina, Hany Ferdinando, Teemu Myllylä, Tarja Maarit Pölkki

11. **Challenges and opportunities for digital solutions in cerebrovascular disease care** Henna Härkönen, Kirsi Myllykangas, Miia Jansson
12. **Automatic Measurement of Body Composition from Computed Tomography Scans of Colon Cancer Patients** Helinä Heino, Reetta Häivälä, Egor Panflov, Tero Rautio, Anne Tuomisto, Päivi Sirniö, Juha Saarnio, Sanna Meriläinen, Aleksei Tiulpin
13. **Intelligent Mental Workload Mobile Application in Personalized Digital Care Pathway for Lifestyle Chronic Disease** Pantea Keikhosrokiani, Minna Isomursu, Olli Korhonen, Tan Teik Sean
14. **Preliminary Studies on mm-Wave Radar for Vital Sign Monitoring of Driver in Vehicular Environment** Daljeet Singh, Theresa Eleonye, Lukasz Surazynski, Hany Ferdinando, Atul Kumar, Hem Dutt Joshi, Mariella Särestöniemi, Teemu Myllylä
15. **Effects of a digital patient journey solution on patient outcomes and health care utilization: a pragmatic randomized controlled trial** Miia Jansson
16. **Near-infrared spectroscopic study towards clinical radiotherapy treatment monitoring** Priya Karthikeyan, Hany Ferdinando, Vesa Korhonen, Ulriika Honka, Jesse Lohela, Kalle Inget, Sakari Karhula, Juha Nikkinen, Teemu Myllylä

Conference Proceedings

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

- **Volume 1:** <https://link.springer.com/book/10.1007/978-3-031-59080-1>
- **Volume 2:** <https://link.springer.com/book/10.1007/978-3-031-59091-7>

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., Keikhosrokiani P., Singh D., Harjula E., Jansson M., Tiulpin A., Isomursu M., van Gils M., Saarakkala S., Reponen J. (eds.) Nordic Conference on Digital Health and Wireless Solutions 2024 (NCDHWS2024). CCIS, vol. 2083-2084, pp. XX. Springer, (2024).

Exhibitors



NGK EUROPE



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6GESS

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

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

Sanna Tuomela, Coordinator, Energy
sanna.tuomela@oulu.fi



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

Professor Osmo Tervonen
osmo.tervonen@oulu.fi



DIGIHEALTH

UNIVERSITY OF OULU

DigiHealth – Our digital health knowhow

Digital health aims to make health and wellbeing services accessible to everyone, regardless of time or place. The future of healthcare is personalised, predictive and preventive, bringing effective health services to the aging population, improving the quality of care, and transforming the way we think about looking after our health.

Why digital health?

Digital health solutions free up resources and help healthcare professionals to focus on what really matters - using expertise to care for patients and provide them the best care possible. At the University of Oulu, we combine expertise from the fields of technology, medicine, and economy to develop research based future solutions for real life health and wellbeing needs and challenges. Join us in the creation of future digital health!

Contact Us

Professor Simo Saarakkala, Director DigiHealth
simo.saarakkala@oulu.fi

Professor Jarmo Reponen, Vice Director DigiHealth
jarmo.reponen@oulu.fi

Coordinator Tuire Salonurmi
tuire.salonurmi@oulu.fi

oulu.fi/en/research/creating-better-health-our-digital-health-knowhow



DigiHealth research themes

DigiHealth is a strategic profiling theme of the University of Oulu. We develop and validate novel digital technologies for data-driven health applications. With our strong expertise in medicine, wireless solutions, big data analytics and business we can respond to bottlenecks in health care and services. This is done through a wider uptake of eHealth solutions and via their interoperability and cost-efficiency.

DigiHealth includes Faculty of Medicine, Faculty of Information Technology and Electrical Engineering, Faculty of Biochemistry and Molecular Medicine, and Oulu Business School. There are over 40 principal investigators and more than 100 researchers linked to these disciplines.

Next-generation data for digital healthcare

At the University of Oulu, we have large understanding in genetic and molecular mechanisms of diseases and we have identified risk factors for several diseases threatening lifelong health. Based on this knowledge we are implementing novel wireless biosensors. This expertise provides a unique foundation that will enable the generation of large and novel data sets from molecular “omics”, big data and tailored biosensors, depicting with unprecedented precision the “health landscape” of future patients.

Professor Jukka Hakkola

jukka.hakkola@oulu.fi

Wireless system level architectures for future digital healthcare

University of Oulu has an impressive track record on wireless systems research, including communications, positioning, signal processing, big data and security. An interoperable DigiHealth concept will be capable to operate with heterogeneous and dense network environments. It provides dependable end-to-end data transmission chains and adopts seamlessly to a hospital’s electrical systems, even from outside the hospital, using mobile medical platforms.

Professor Jari Iinatti

jari.iinatti@oulu.fi

Medical AI to support clinical decisions

We have strong competence in using machine learning methods to analyze physiological signals and medical images to derive novel quantitative indices for diagnosing and predicting disease progression. Strong areas include neurology, cardiology and musculoskeletal diseases.

Professor Tapio Seppänen

tapio.seppanen@oulu.fi

Impact and business solutions of digital health

Our strength on the way to personalized medicine is in the evaluation of the impact of digital health solutions, novel health data management approaches and system level implications. Our expertise offers a unique foundation for studying emerging data driven futures, dependent on analytics, AI, machine learning and 5G/6G, to develop and deploy insights for improving outcomes and reducing costs in health care.

Associate Professor Timo Koivumäki

timo.koivumaki@oulu.fi

HOLA 5G OULU

Advanced technology for: enhanced patient care, streamline healthcare workflow.

Oulu University Hospital pioneering a game-changer for healthcare.

More info here



1. What is “Hola 5G Oulu”?

Harness the power of a robust private 5G network and wireless wearable technologies. Patient care now can be enhanced, quality time with patients is increased, and services are maintained at its best, no matter of disturbance like a blackout.

2. Use cases transforming healthcare



AR/VR visualisation of patient data in operating rooms & patient visit



More quality time with patient, less time retrieving data on-screen



Testing environment to flexibly develop healthcare technologies

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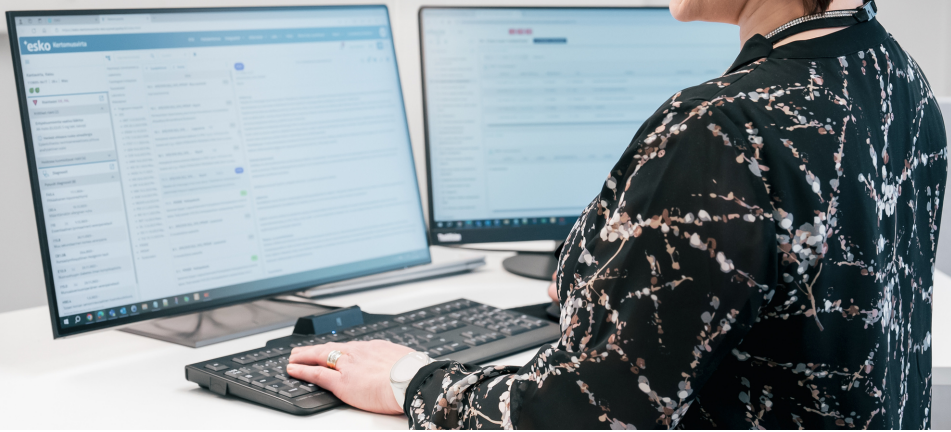


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WIRELESS INTEGRATED CARE



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ESKO patient information system was born out of the users' idea. Development continues in close collaboration with the users.

All professional groups have rated ESKO as the best information system in user surveys.




Doctors The best grades 8.7 in *Patient information systems as a doctor's work tool survey* in 2010, 2014, 2017 and 2021



Nurses Best grades 8.2 in the 2020 study *Information systems to support the work of nurses in different operating environments*



Practical nurses Best grades 8.1 *Information systems to support the work of practical nurses in different operating environments -survey* in 2022.



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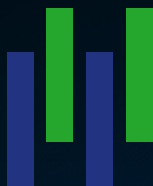
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We would also like to thank our International Reviewer Committee and International Advisory Committee. Their full listing is available in the conference website nordic-digihealth.com/committees and in the conference books.



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