



PANEL #2

NICE
MAY 2025

Theme

Health Challenges in Digital Environments

NexComm 2025 & DigitalWorld 2025



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Moderator

Prof. Dr. Jonny Karlsson, Arcada University of Applied Sciences, Finland

Panelists

Dr. Ove Lintvedt, University Hospital of North Norway, Norway

Ph.D. Candidate Simin Mirzaei, University of British Columbia, Canada

Ph.D. Candidate Thomas Hellstén, Arcada University of Applied Sciences,
Finland

Prof. Dr. Hirokazu Hasegawa, Center for Strategic Cyber Resilience R&D
National Institute of Informatics, Japan

Prof. Dr. Panos Nasiopoulos, University of British Columbia, Canada



Chair Introduction

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Digital Technologies and their Impact on Human Health

- **Huge opportunity:** Even though a lot of people are “online”, we are still not fully making use of digital tools to improve health.
- **Telehealth grew** fast during the **COVID-19 Pandemic**.
- **AI is gaining ground:** AI tools are already used to some extent to help with paperwork and medical decisions.
- **Global progress:** More than 60% of countries now have a national plan to use digital technology in healthcare, showing strong global interest in this area.



Jonny Karlsson
Arcada



Chair Introduction

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Opportunities and Challenges in Digital Health

- **Can save lives:** Simple digital tools like telehealth and health apps could help save over 2 million lives in 10 years—with just small investments per person (WHO/ITU).
- **Better access and care:** Telemedicine lets people—especially those with chronic illnesses—get care from anywhere. Real-time data helps doctors make faster, better decisions.
- **Trustworthiness worries:** Worries about how health data is used—is it safe? Handled fairly? AI systems can also show bias etc.
- **Digital divide:** While 5.5 billion people are online, 2.6 billion are not (ITU). Without equal access, digital health could leave many behind.



Jonny Karlsson
Arcada



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Key Questions for Discussion

- **Innovation vs. Privacy:** How can we use new tech like AI in healthcare while keeping data safe and respecting patient rights?
- **Fair access:** Will digital health help everyone, or just those with internet and devices? How can we close the digital gap?
- **The human side:** Does tech make care better—or risk losing the personal touch?



Jonny Karlsson
Arcada



Panelist Position

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Digital Health Challenges: Clinical Workflows, Cognitive Load, & Ethical Balance

- **Fragmented systems increase cognitive burden**
 - Digital tools often add complexity when systems don't integrate well.
- **Risk of undermining clinical reasoning**
 - Predefined workflows can limit space for clinical judgment and individualized care.
- **Data ≠ insight**
 - More data doesn't always mean better care.
 - An overload of non-contextualized data can distract from what truly matters to patients.
- **We need human-centered design, not just tech push**
 - Solutions must be grounded in real clinical needs and patient contexts.
- **Clinical workflows are not plug-and-play**
 - Digital tools must adapt to care pathways—not the other way around.
- **Evaluation as learning**
 - Systematic evaluation is essential to a Learning Health System.
 - We often study failures, yet much can be learned from success.



Ove Lintvedt
PhD, Clinical
psychologist, ICT-
engineer, Business
economist

University Hospital
of North Norway -
Norwegian Centre
for E-health
Research



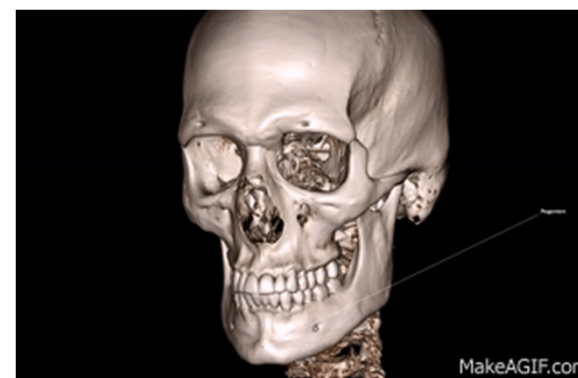
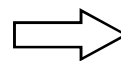
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CBCT Imaging Technology and its Impact on Human Health



Simin Mirzaei
PhD Candidate in
Electrical and
Computer
Engineering, The
University of British
Columbia, Canada





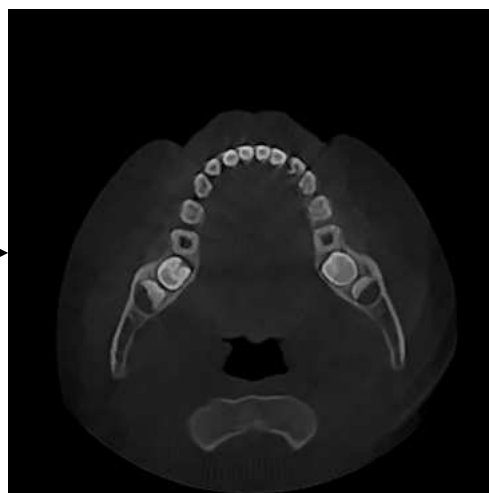
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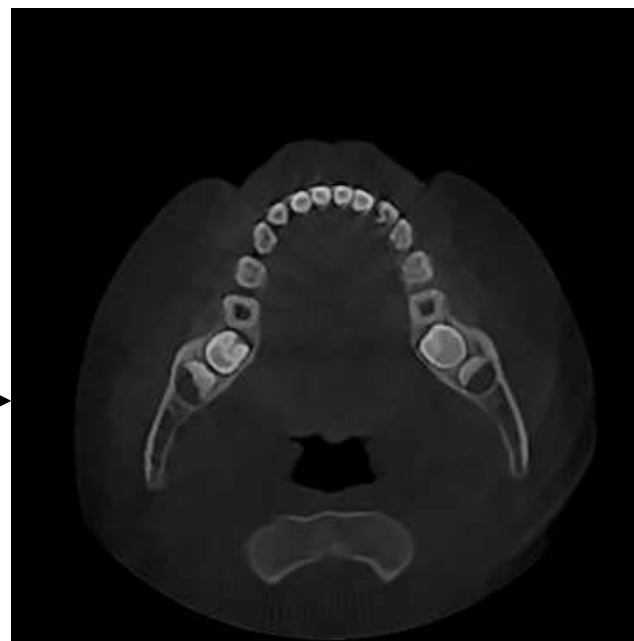
CBCT Imaging Technology and its Impact on Human Health



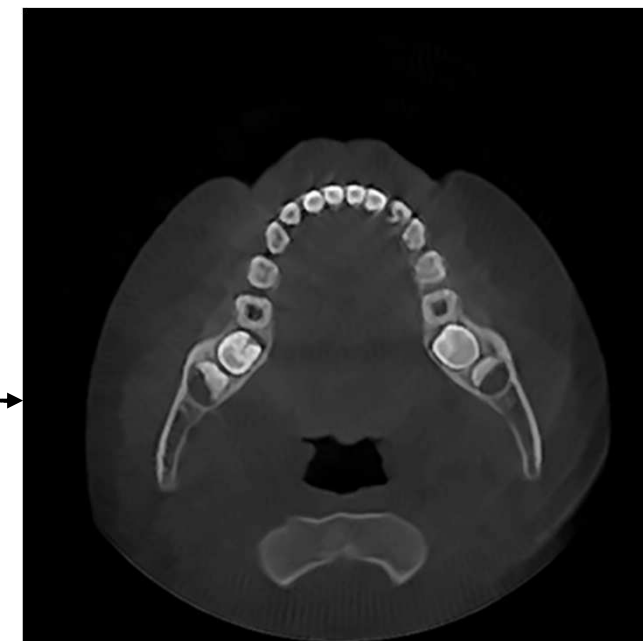
Low-dose CBCT



Denoised CBCT



Denoised & upscaled CBCT



Denoised, upscaled & inverse tone mapped CBCT



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CBCT Imaging Technology and its Impact on Human Health

Benefits:

- **Accurate 2D and 3D representations of anatomical structures**
- **Lower radiation dose compared to conventional CT**
- **Quick scan time**
- **Cost-effective**
- **Improved diagnostic accuracy and treatment planning**
- **Minimal patient preparation**



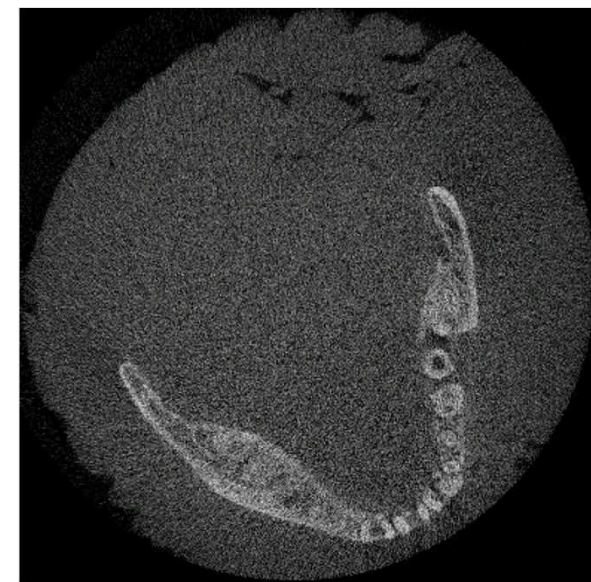
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CBCT Imaging Technology and its Impact on Human Health

X Drawbacks:

- Lower Signal-to-Noise Ratio (SNR) and increased noise (artifacts)
- Low spatial resolution and a potential loss of anatomical details
- Low brightness and contrast (based on SDR technology)
- Challenges in segmenting bony structures from surrounding soft tissue



An example of a low-dose CBCT image



Panelist Position

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- **Senior Lecturer in Physiotherapy, PhD student**

- **Hands on action:** can we maintain human touch in a digital age?
- **Data accuracy and ownership:** what kind of data do digital devices collect, and how reliable is it? Who owns the data?
- **Clinical responsibility:** AI's role in clinical decision-making? Who is responsible for possible mistakes in autonomous treatment decisions or diagnostics?
- **Education:** how should we provide training for healthcare professionals and education for patients to support integration into daily practice? Is it mostly practiced through a “learning by doing” approach?



**Thomas
Hellstén**
Arcada
University of
Applied
Sciences



Panelist Position

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- **Cybersecurity Researcher**
 - “Resilience” is essential
 - Conventional countermeasure:
Disconnect compromised devices from NW
 - Maintain the minimum functions and continue business

- **Especially Critical infrastructure**
 - Medical field: Patient safety is the top priority
 - Medical services must be maintained even in the event of a total shutdown of the health care system



Hirokazu Hasegawa

National Institute of
Informatics, Japan



Panelist Position

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- **Our project: Supported by Key and Advanced Technology R&D through Cross Community Collaboration Program (K-Program)**
- **How to maintain essential functions under cyberattacks**
 - Identify medical devices that should not be stopped
 - Suspend of almost devices do not lead to emergency situations
 - But, we cannot suspend some devices such as Class IV
- **Electronic medical record system**
 - Some medical professionals have little experience using paper medical records
 - Support system is required
- **Not for Security, but for Safety**



Hirokazu Hasegawa

National Institute of
Informatics, Japan



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Should we ever trust AI to manipulate or regenerate medical images?

- Recall that every pixel is recreated!

AI vs. Human Expertise in Diagnosis

- Where do we draw the line between expert medical judgment and AI-driven decisions?



Dr. Panos Nasiopoulos, P.Eng., FCAE, FIEEE
Associate Head, Graduate Affairs
Professor
TELUS Chair in Advanced Information
Director, Digital Multimedia Lab
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University of British Columbia



Q&A

VALENCIA
April 2025

**THE STAGE IS
YOURS**