



Panel #2

NICE
FALL 2024

NetWare 2024 & SocSys 2024

PANEL #2

**Advances and Adversities in Digital Health in
Modern Society**



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Moderator

Derek Ross, University of Limerick, Ireland

Panelists

**Prof. Dr. Ita Richardson, Lero - the Science Foundation Ireland Research
Centre for Software and University of Limerick, Ireland**

Ph.D. Candidate Poulomi Guha, University of North Texas, USA

Dr. Antoine Riaud, ABB, Switzerland

**Ph.D. Candidate Felicien Izaturwanaho, School of Psychology, Trinity
College Dublin, Ireland**

Ph.D. Candidate Mustafa Ahmed, Queen Margaret University, UK

Prof. Dr. Petre Dini, IARIA, USA/EU



Chair Introduction

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- Human Factors are concerned with experiences and outcomes for people in contexts and systems that are often complex and safety critical. Ethical use of personal data in health contexts requires that fully informed consent is obtained. With the increasing use of AI and ML using algorithms, is it possible for patients, members of the public and clinicians give and obtain informed consent when it is possible that none of them will understand the data processing and transformation that their personal data is likely to be subjected to?
- What contribution can Human Factors and Socio-Technical Systems analysis, and Human Centered Design bring to this complex space?



Derek Ross
University of
Limerick





Panelist Position

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- **Connected Health is where *patient-centred care* results from following defined *healthcare pathways* undertaken by *healthcare professionals, patients and/or carers* who are supported by the *use of technology* (software and/or hardware), *regulated* when used as a Medical Device, and facilitating appropriate *health data sharing*.**
 - **Health Information Technology: Hardware & software used in the provision of healthcare**
 - **Pathways: How healthcare is undertaken in hospital, in the clinic, at home.....**
 - **People: Healthcare professionals, patients, carers, software engineers, patient groups, IT personnel....**
 - **Data: As software engineers we need to ensure that data is consistent, private, secure, robust, correct.....**
 - **Regulations and standards: Apart from clinical and medical standards and GDPR, there are software engineering standards for medical devices**



Ita Richardson
Professor of Software
Quality,
Lero and University of
Limerick



MacMahon, S.T. and Richardson, I., 2023. Pathways, technology and the patient—connected health through the lifecycle. *Frontiers in Digital Health*, 5, p.1057518.



Panelist Position

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- Theme: Advances and Adversities in Digital Health in Modern Society
 - How does digital health affect healthcare?
 - **Simplified health teaching & prevention:** Digital health solutions can make health education and prevention more accessible, particularly in underserved regions.
 - **Culturally tailored tools:** Mobile applications that offer culturally and demographically relevant health information can raise awareness and prompt early action.
 - **Addressing healthcare shortages:** Telemedicine helps doctors provide essential consultations to rural communities, bridging healthcare gaps.
 - **Expanded access to specialists:** Telemedicine ensures prompt medical advice and treatment for disadvantaged areas, especially important for chronic conditions.
 - **Remote monitoring for long-term patients:** Virtual consultations and remote monitoring allow patients to manage their health at home, improving quality of life and reducing hospital visits
 - What are the negative impact of health technology?
 - **Data privacy and security concerns:** With the use of electronic health records and other digital technologies, there is a risk of data breaches and cyber-attacks. This can compromise patients' privacy and sensitive medical information, leading to identity theft and other fraudulent activities.
 - **Disrupting human interaction:** The use of technology in healthcare can sometimes lead to a reduction in face-to-face communication between healthcare providers and patients. This can negatively impact patient satisfaction and reduce the effectiveness of care.
 - **Medical errors:** While technology can help reduce errors, it can also introduce new types of errors. For example, incorrect or incomplete data entry, system malfunctions, and user errors can lead to misdiagnosis errors and adverse patient outcomes.
 - **Dependence on technology:** As healthcare providers become more reliant on technology, there is a risk of losing basic clinical skills and critical thinking. Over-reliance on technology can also lead to complacency and a lack of attention to detail.



Poulomi Guha
PhD Student,
University of North
Texas, USA



Panelist Position

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- **Opportunities and challenges in digital *mental* health**
 - **An unmet need (stigma, lack of access, privacy concerns). Highly time-consuming care.**
 - **Opportunities: data availability for diagnostic (social media, browsing history, behavioral patterns) and action tools (LLM) becoming available**
 - **How to make sure it is a progress? Active vs passive disclosure? Permission system? Legal & technical guardrails to improve privacy & efficacy trade-off beyond current state of the art (of having a therapist).**
 - **Potential use cases: PTSD / radicalization / loneliness / self-harm**



Antoine Riaud
Senior research scientist,
ABB corporate research
center (Switzerland)

Opinions are expressed
in this panel in a
personal capacity and do
not necessarily reflect
ABB positions



Panelist Position

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Theme: Advances and Adversities in Digital Health in Modern Society (Electronic Health Records & Health Disparities)

Introduction

- The healthcare system has been using electronic record-keeping for centuries now.
- Development of EMRs/EHRs/EPRs took shape in the 20th century.
- Vulnerable groups like those who are experiencing homelessness or drug (ab)use and refugees, who have the highest care needs, also have the worst access to healthcare, despite the advancement in healthcare delivery - a good example of Tudor Hart's Law.

Benefits of EMRs/EHRs/EPRs

- Improved care coordination and planning.
- Enhanced patient safety and system performance.

EMRs/EHRs/EPRs Impact on Healthcare

- Affected communication within organizations and with patients
- Affected workload for healthcare professionals and introduced some medical errors
- Raised privacy and security concerns

Direction

- Need for integrated and trauma-informed systems to cater for the needs of vulnerable groups like a mobile health records app with **KEY** features:
 - Integration with existing IT systems.
 - Offline functionality.
 - Sharing health records with whomever you choose, with the highest level of security.



Felicien Izaturwanaho
SFI AdvanceCRT PhD Candidate,
Centre for Innovative Human
Systems, School of Psychology,
Trinity College Dublin.



Panelist Position

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- **User-Centric Design**
Functional, Stylish
- **Customization & Accessibility**
Integrative, Adaptable
- **Continuous User Engagement**
Iterative, Satisfying

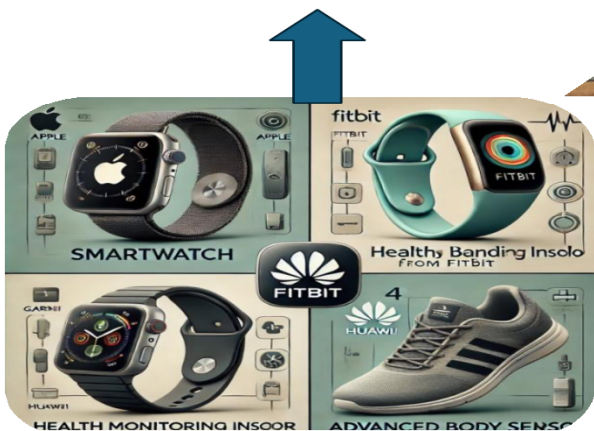


Research

- **Innovation Balance**
Performance,
Applicability
- **Ethical Considerations**
Privacy, Transparency
- **Longitudinal Studies**
Comprehensive,
Resource-Intensive



- **Data Management**
Overwhelming, Complex
- **Validation & Standardization**
Accuracy, Reliability
- **Technology Adoption**
Resistance, Integration



Industry



Clinical



Mustafa Ahmed

Queen Margaret
University,
Edinburgh



Panelist Position

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- **Gradual negotiation with the technologies around us - Tom Chatfield**
- **Environmental Remanence (Real vs Virtual)**
 - Brain and games
 - Immersion environments
 - VR-based recovery
 - VR-training
- **Co-evolving with Technologies**
 - Uninformed (Ignorance) and Informed (hesitation)
 - Human minds are literally extended into aspects of the environment surrounding them
 - Metaverse is training the AI-based tools with virtual models
- **The power of Digital**
 - Practicing, learning, trusting
 - Mental upgrade and digital acceptance (through Digital Literacy)



Petre Dini
IARIA

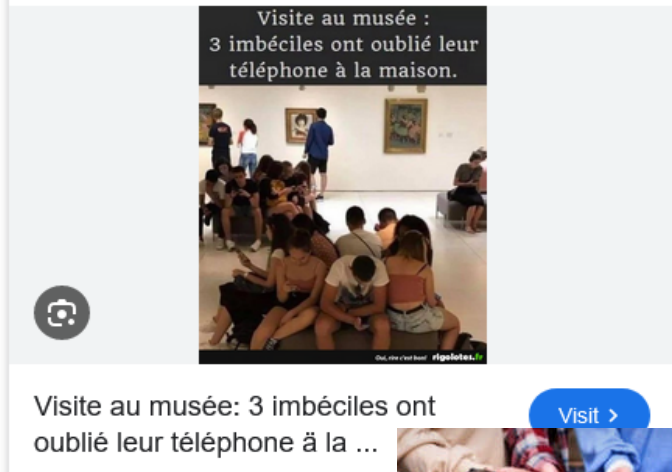
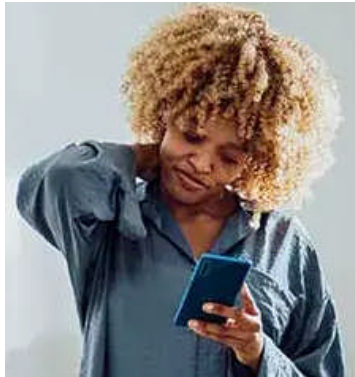


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Addiction and health side-effects

Text neck



Petre Dini
IARIA

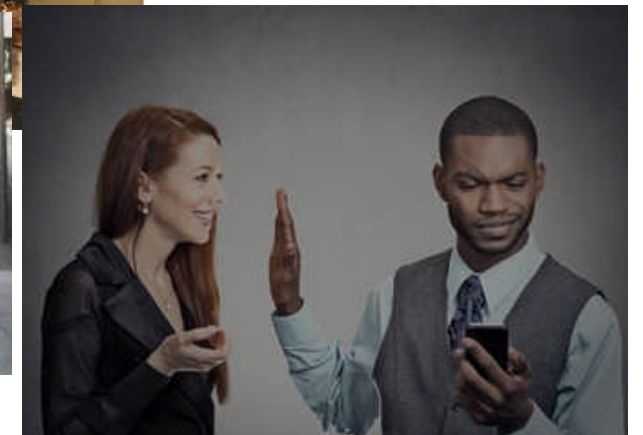
Smartphone finger

Each hand is made of 27 bones, 35 muscles, and over 100 tendons connecting bones and muscles. Your flexor tendons bend your fingers, and tendons that straighten your fingers are called extensor tendons.



Adversities

- Becoming Mentally Lazy
- Light emitted from your mobile device's screen might just be messing up your sleep cycle
- It might affect vision (in progress studies)



- **Body Health impact**
- **Impact on Vision**
- **Impact on Mental stasis**
- **Impact on the Backbone**
- **Impact on Hands, Wrists, and Fingers**
- **Impacts on Rest, Leisure, and Well-Being**



Petre Dini
IARIA