Theme
Health and Digital Services

Topics: Trust, Accessibility, Cross-border health data governance, Patient-centered digital ecosystems.

Keywords: Digital health, Telemedicine / remote monitoring, Interoperability and data sharing, AI diagnostics and precision medicine, Health data privacy and ethics, Digital inclusion in healthcare

PANEL #1

BARCELONA
2025

Moderator

Dr. Jamie McGlothlin, RSM US LLP, USA

Panelists

Dr. Thomas Michelitsch, Sorbonne Université, CNRS, France

Dr. Francisco Javier Bermúdez Ruiz, University of Murcia, Spain

Prof. Dr-Ing. Kristina Schaaff, IU International University of Applied

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

Dr. Mehluli Masuku, Sorbonne University Abu Dhabi, UAE (United Arab Emirates)

Panelist Position

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AI: Efficient use of resources, Process optimization, Cost reduction, Waste reduction

Patient Experience: Improves outcomes and margins

Health Equity: Diversity is our strength, it is not just about being “color blind”

Cloud Computing: Access to more data and information

Data virtualization

We have too many tools and too much data

Must give simple information at the right time

Alert fatigue reduces quality of care

Jamie McGlothlin

RSM

USA

Panelist Position

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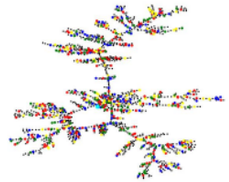
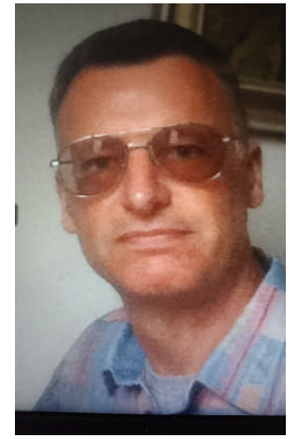
Modelers perspective (prevention of epidemic spreading)



- AI may help for diagnostics to identify diseases (cancer, ..) blood tests, etc.
- Digitalization cannot replace direct contact patient - medical doctors
- Health Equity (HE) is essential in prevention of epidemics, insufficient HE may boost spreading (remember COVID-19)



Thomas M. Michelitsch,
Senior Scientist
Institut Jean le Rond d'Alembert
CNRS/Sorbonne Université

- Important is to remove obstacles such as poverty that prevent access to health services
- AI may help to identify weaknesses in a Health System (HS)
- Close interaction of modelers and deciders in HS is important to avoid fatal delays in taking prevention measures
- Digitalization is inalienable, but cannot make the job alone without close supervision
- Outcomes of models may lead to suggestions of improvements in prevention of epidemics

→ **Possible improvement of health and digital services**

Panelist Position

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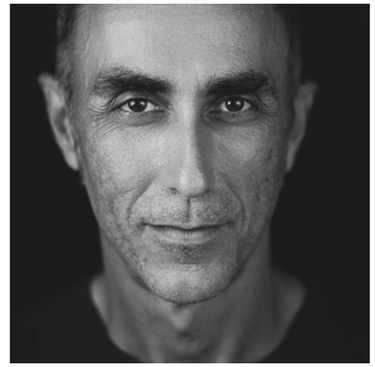
- Development, evaluation and implementation of computer systems for **clinical decision support**
  - Business intelligence techniques + rule-based inference engine to integrate data and knowledge
  - → Alert, recommendations, and global surveillance
- **Computerized clinical guidelines** and **clinical process flow** modeling, and tools for information visualization in hospitals
- **Data interoperability**, clinical standards and process models (such as HL7, FHIR, SNOMED CT, OMOP, and BPM), to visualize massive clinical data



Prof. Dr. Francisco Javier Bermúdez Ruiz
MedAILab Research Group
Computer Science Faculty
University of Murcia, Spain

Panelist Position

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- Development of AI systems should not only include technical innovation but also the social and emotional components
- Integration of empathy can enhance human-machine interaction
- Affective computing introduces new pathways for human-machine interaction, presenting both opportunities and ethical risks

- AI should be used to support people, not to replace them

Kristina Schaaff
IU International University of Applied Sciences

Panelist Position

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Mehluli Masuku
Sorbonne University Abu Dhabi

- Cross border legal interoperability improves patient care
  - Patients are mobile, moving from one country to another. However, their data is not easily shareable due to incompatible legal provisions between countries across the world.
  - Different countries have different legal data requirements for personal data.
  - Patient health data that is not easily integrated into patient systems across borders is likely to fall into the cracks, and eventually lost, creating gaps in patient histories.
  - Legal interoperability can reduce the fragmentation of patient data between across borders.

Panelist Position

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Mehluli Masuku
Sorbonne University Abu Dhabi

- Whilst technical interoperability of health data can easily be overcome be overcome through messaging and terminology standards, cross border legal interoperability (compatibility between health data laws) remains a challenge.
- Cross border legal interoperability of patient data challenges are further complicated by the sensitive nature of patient health data (sensitive personal data), coupled with personal data protection laws, e.g., GDPR, and country-specific data protection and health data laws.
- There is a need to improve and promote cross border patient data exchange for seamless patient care across border, albeit within the realms of patient privacy

Panelist position

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- How can legal interoperability of patient health data across borders be improved whilst propagating patient privacy and respect for data protection laws?

Mehluli Masuku
Sorbonne University Abu Dhabi

Panelist Position

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Petre Dini

IARIA, USA/EU

Image: Vision, Position, Muscles, Bones,

Drugs discovering

Situation monitoring

Interactive toys: Mental disorders, mental healing etc.

Help for vulnerable classes: Young pupils, children, older adults, etc.

Rehabilitation tools (Immersion, Virtual reality)

Body: Vision, Position, Muscles, Bones,

Brain (cognition): Sensory interpretation, adaptive real-immersive hysteresis, induced hallucinations, etc.

(physical): Electromagnetic waves (nanoA -10^-9 A -, ..., NanoV, ..., nSeconds)

Habit: Squared instead of natural, digital guidelines vs human guidelines, addictive, etc.

Digital stress: Mental disorders. digital addiction, digital dependency, etc.

Vulnerable classes: Young pupils, children, older adults, etc.

Panelist Position

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- Immersive Literacy
  - Environmental Remanence (Real vs Virtual)
  - Co-evolving with Technologies
  - The power of Augmented Reality and Immersion (from acceptance to use)
- Personalized Cognitive Assistance
  - Cognitive Rehabilitation
  - Elderly Cognitive Support
  - Learning Disabilities
- Challenges
  - Adaptive algorithms (Interactive Content, Feedback mechanisms)
  - Accessibility (Individuals in low-resource settings or with severe disabilities)
  - Privacy and Ethics (Safeguarding the sensitive data collected from users)
- (Hidden) Side effects
  - Spatial deskilling (individuals lose their ability to perform spatial tasks)
  - Real-Virtual Cognitive Mismatch (reduced transfer of skills and knowledge from virtual to real settings)
  - Immersion Dependency

Body Health impact

- Impact on Vision
- Impact on Mental status
- Impact on the Backbone
- Impact on Hands, Wrists, and Fingers
- Impacts on Rest, Leisure, and Well-Bein

Dependency on Immersive Environments

Several ways (sensory disorientation, social interactions, cognitive overhead)

From Immersive to Real Environments (sensory readaptation, isolation, decisions)

From Real to Immersive Environments (overstimulation, confusion, escapism)

Body & Habit

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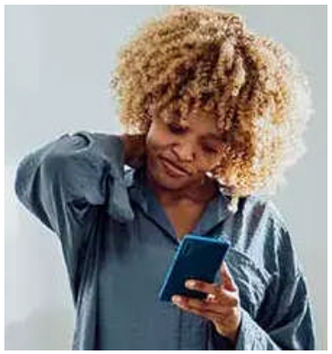
Addiction and health side-effects

Petre Dini

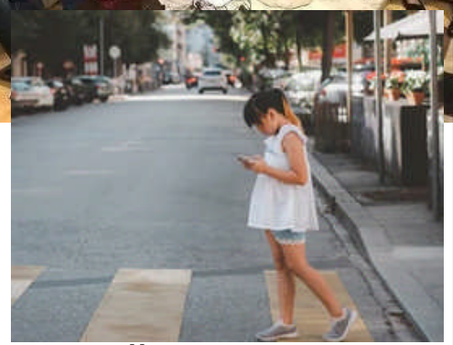
IARIA, USA/EU

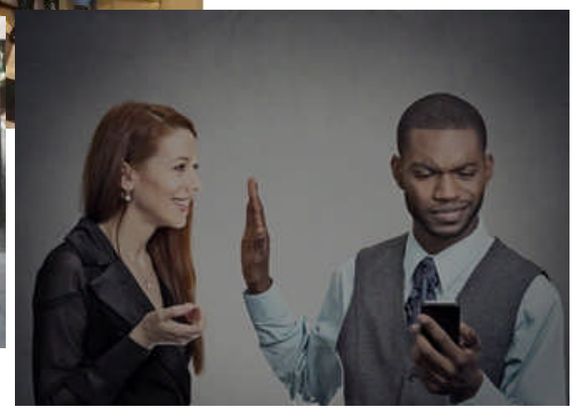
Text neck



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)

Cognitive dependency

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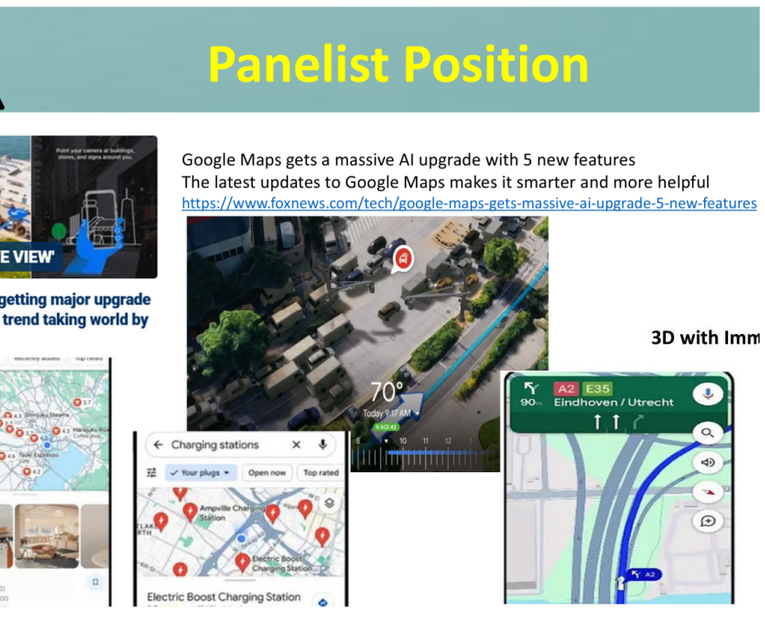
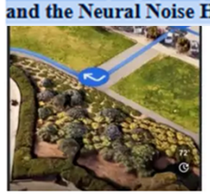
- Dependency on Immersive Environments
- Several ways (sensory disorientation, social interactions, cognitive overhead)
- From Immersive to Real Environments (sensory readaptation, isolation, decisions)
- From Real to Immersive Environments (overstimulation, confusion, escapism)



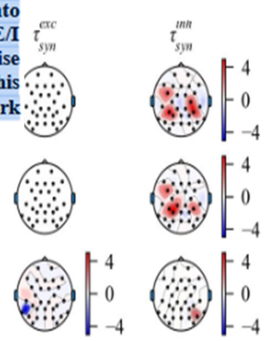
Abstract— Effective language processing relies on the brain's capacity to decode rhythmic cues in speech, a function primarily supported by activity in the theta frequency band. According to the Temporal Sampling Framework, impairments in this process may contribute to the phonological deficits observed in individuals with Developmental Dyslexia (DD). These challenges cascade into higher-frequency bands, affecting the integration of phonemes, words, and phrases, ultimately compromising reading and writing fluency. Early diagnosis and treatment are crucial for ensuring proper personal and academic development in children. In this study, we propose a non-invasive methodology that combines ElectroEncephaloGraphy (EEG) data with a surrogate modelling framework to detect early imbalances in Excitation/Inhibition (E/I) mechanisms. We applied this methodology to a cohort of children, divided into controls and DD groups, and compared the inferred E/I mechanisms with patterns predicted by the neural noise hypothesis. We found that the results obtained using this framework align with both the Temporal Sampling Framework and the Neural Noise Hypothesis.



Developmental Dyslexia and Nerve Noise
Low frequency stimuli [4.5, 40]
Parietal occipital regions:
Dyslexia:: deficit in syllables processing which is associated with the Theta band (4-7 Hz)
Brain Models: brain models that captures large-scale brain activity
From Immersive to Real Environments

Petre Dini

IARIA, USA/EU



Increase in E/I in parietal and frontal regions -> Neural Noise Hypothesis in Dyslexia

Increment of $\tau_{syn\,I}$ in frontal and parietal-central for 4.8 Hz. Significant differences decreases as stimuli increases.

Delayed responses of inhibitory currents due to increment of $\tau_{syn\,I}$ also aligns with Neural Noise Hypothesis in Dyslexia.

https://www.thinkmind.org/library/BRAININFO/BRAININFO_2025/braininfo_2025_2_30_90046.html

THE STAGE IS YOURS