



## PANEL #4

Athens  
March 2024

# DataSys 2024 & ComputationWorld 2024

**Theme:**

**Training and Education through Virtual Reality - Boosting Digital Cognition and AI Literacy**



# CONTRIBUTORS

Athens  
March 2024

## Moderator

Moderator: Prof. Dr. Hans-Werner Sehring, NORDAKADEMIE gAG, Germany

## Panelists

Panelists:

Dr. Mika Helsingius, Finnish Defence Research Agency, Finland

Dr. Yasmina Kebir, University of Lorraine, France

Prof. Dr. Hans-Werner Sehring, NORDAKADEMIE gAG, Germany

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



# Panel Moderator

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- Panel moderator:
- **Hans-Werner Sehring**
- Professor of Software Engineering  
at NORDAKADEMIE gAG, Elmshorn, Germany
- CS studies in Passau and Hamburg, Germany  
PhD in Hamburg, Germany
- 15 years industrial experience
- **Research interests**
- Software engineering, model-driven software engineering
- Programming languages, modeling languages
- Media-based information systems



# Panelist Position

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## ▪ Flipped learning

- **Traditional** lectures and lab classes:  
classroom teaching is exhausting for students;  
actual understanding happens by (solitary) learning
- **Flipped learning: pre-recorded digital lectures**  
repeat as needed;  
watch a individual speed
- **Flipped learning: on-premise or virtual in classroom mode**  
moderated discussions;  
supervised lab classes



Hans-Werner Sehring  
NORDAKADEMIE



# Panelist Position

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- **Active learning, virtual experimentation**
  - **Colleagues' project *CrossLab***  
Remote use of (physical) laboratories  
Ongoing research, working laboratories and multiple sites
  - **Concept-oriented Content Management**  
Using extensive personalization means to allow students (student groups, courses, etc.) to adapt and create content  
*Warburg Electronic Library* (digital workbench for the humanities) applied in multiple courses
  - **Minimalistic Meta Modeling Language (M<sup>3</sup>L)**  
Experimentation environment for programming languages;  
Syntax (learn how to design grammars, how to extend languages, etc.) and  
Semantics (understand paradigms, experience tractable feature sets, etc.)



Hans-Werner Sehring  
NORDAKADEMIE



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- **Background in digital electronics and software science, deeper knowledge in video signal processing and compression.**
- **Current duties: Technology forecasting for military and cyber defense, paying attention to information warfare also.**
- **“Useful” AI is coming and developing faster than ever.**  
Following the research in AI since 1980s. A strong feeling that not everybody has understood the level of acceleration during the last two years. Even AGI seems to come sooner than thought before, one of the topics at Polish Armed Forces public online seminar in the end of 2023.
- **I must look AI from military viewpoint, as I am paid for that.**  
There are some special characteristics in that. In military you don't always have real training data, you must prepare for unique incidents or for something with disastrous consequences.
- **Virtual reality is one possibility, often it is the only way to do some things.**  
Training with artificial equipment, real humans and perhaps feedback from real hardware. One challenge is how well the model represents real world scenario. US DoD 5 principles of ethical AI (responsible, equitable, traceable, reliable, governable) sound also useful.



Mika Helsingius  
FDRA  
Finland



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- **Man in the loop – current hot topic in autonomous systems.**

Military loves OODA-loop (observe, orient, decide, act). There has been at least political desire to put a man in the decision loop, but simulations have shown blunt results. Cat is already out of the bag and this year we will probably see more full autonomy in the wild.

- **Do we overestimate human free will and underestimate future skills of AI?**

Kahneman / Tversky theory of systems 1 and 2, 99% of decisions are automatic and fast, 1% need conscious and slow decisions. “Consciousness as a Memory System” by Budson et. Al. 2022. Does this mean that 99% level of “human  $\equiv$  AI” is pretty easy to achieve ? How much does it matter for outside observer what happens in the “mind” of AI ?

- **Training ethical and safe AI**

Microsoft AI researchers have said that we would need psychologist in addition to engineers for training AIs. Prof Avi Loeb from Harvard has said that current training of AI looks like helicopter parenting, it’s difficult to tell what is right and wrong to kids just by preaching. Kids have to be convinced to behave properly, perhaps we would need more teachers, educationalists and kindergarten teachers for training advanced AI models.



Mika Helsingius  
FDRA  
Finland



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- **Risks in training AI in virtual and other environments**

Especially for military and other critical systems one has to be careful with malicious information and hidden trapdoors which are inserted in training data and possible libraries. It is also slowing the use of AI, in FDF our data is in separate network and we can not use it for training any system which is connected to internet.

- **AI, cyber security and information warfare is a complex and interwoven system.**

Fake news, troll factories and traditional cyber attacks are a problem. In the west these are different disciplines, elsewhere information weapon can be physical, software or directed towards persons or societies. Safety aspects should be taken into an account when designing and training all kinds of AI systems for military use, critical national infrastructure or any important systems.

- **Cognitive aspect of warfare.**

The theory of reflexive control is a way to make someone behaving in desired way. German term Weltanschauungskrieg means world view warfare. AI can be nasty and powerful tool in wrong hands.



Mika Helsingius  
FDRA  
Finland





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## *Using Virtual reality to assess team members communication skills*

- Communication is an essential **nontechnical skill**, required in any **activity** involving social and professional interactions.
  - Operators' **lack of non-technical skills**, particularly in communication, **contributes to a variety of failures in high-risk** industrial environments.
  - VR training is a form of **experiential learning** that uses virtual reality technology to create a environments that **mimics the real conditions**.
  - VR creates environments in which employees can **practice their communication skills** in similar situations to their real work.
  - It can even help to **improve communication skills by providing feedbacks**.
- ⇒VR will enable us to obtain verbal data to better study the verbal component.
- ⇒BUT : how to analyze all these data in an efficient way?



Yasmina Kebir

Chaire Behaviour  
University of Lorraine



# Panelist Position

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## *How about natural language processing?*

Are we able, with informatic programs, to be independent of human analyses and its subjectivity?

Is NPL sufficiently effective in capturing the context of verbal productions, non-verbal parameters or prosodic ones ?

To recognize if a question in a question, if each question has received a response, humor during the task, all the interventions type that I present earlier.

Is it also able to distinguish between pragmatic and semantic meanings of verbal expressions?



Yasmina Kebir

Chaire Behaviour  
University of Lorraine



# 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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## Learning and accepting the digital environment



Petre Dini  
IARIA

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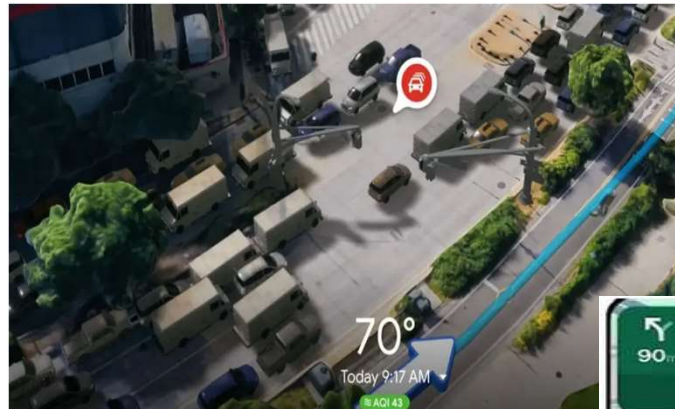
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Google Maps getting major upgrade thanks to new trend taking world by storm

Google Maps gets a massive AI upgrade with 5 new features  
The latest updates to Google Maps makes it smarter and more helpful  
<https://www.foxnews.com/tech/google-maps-gets-massive-ai-upgrade-5-new-features>



3D with Immersive View



Petre Dini  
IARIA





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**Volumetric VR** is particularly suited for applications where realism and true-to-life interaction are critical, such as in detailed **training simulations, realistic historical recreations, or highly immersive storytelling.**



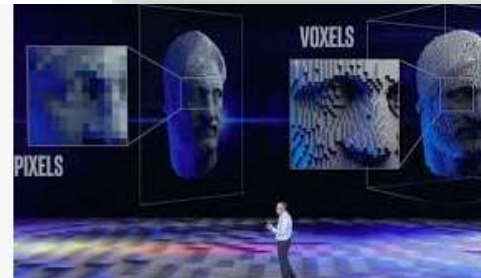
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Alamy  
Cyberspace virtual and augmented ...



Reddit  
Running volumetric fog in VR at 90fps ....



Daily Mail  
Intel introduces 'volumetric video' of ...



Realtra  
Sequoia VR - REALTRA, Inc.