18th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 2024) https://www.incom2024.org

Invited Session:

Extended reality and metaverse to address the social challenges of manufacturing and healthcare in the industry 5.0

INVITED SESSION CODE: `r1i78`

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This session is proposed in the framework of the SUN XR (Social and hUman ceNtered XR, **https://www.sun-xr-project.eu**) project which aims at investigating and developing eXtended reality (XR) solutions that integrate the physical and the virtual world or metaverse from a human and social perspective. The metaverse combines physical reality and digital virtuality, i.e. physical and virtual worlds. Technologies such as virtual reality (VR), augmented reality (AR), mixed reality (MR) and extended reality (XR) are the basis of metaverse and virtual worlds. Furthermore, other technologies such as digital twins, machine vision, natural language processing, networking, neural interface and object recognition, among others, are triggering metaverse applications. Thus, metaverse technologies can be used in the industry and health sectors for social and human interaction in the workplaces, collaborative training and even as decision support systems. In this latter, operations research (OR) techniques such as mathematical programming, simulation and/or metaheuristics/matheuristics, among others; and artificial intelligence (AI) technologies, for instance, deep learning and machine learning can be used to foster the metaverse world to work following defined rules.

In an industrial environment, metaverse applications can prevent workplace accidents, improve job safety creating more immersive experiences for people at work and provide new ways to increase the awareness of possible hazards. Additionally, current decision making processes as production planning and control, supply chain management and logistics can be supported with metaverse approaches. Regarding health applications, XR and metaverse can be oriented to improve physiotherapy protocols in order to increase patient engagement, monitor physiological conditions. and/or provide immediate feedback to the patient. Moreover, XR and metaverse can allow people with communication and motor disabilities to interact with friends and relatives and/or count on residual abilities providing a meaning in terms of communication.

Additionally, metaverse aspects so relevant like system interoperability, security and privacy and interconnectivity with the real world require discussion and further research.

This session aims at solving these dilemmas collecting novel and innovative studies that support the adoption of metaverse technologies and applications by identifying the metaverse challenges and opportunities to overcome their limitations.
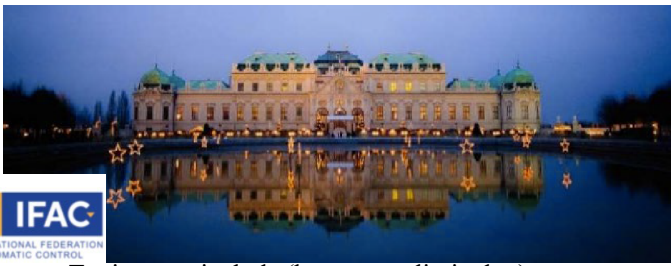
Topics may include (but are not limited to):

- Adoption of AR, VR, MR and XR in industrial and health applications
- Industrial metaverse design and applications
- Healthy metaverse design and applications
- Virtual worlds as a decision making tool in industry
- Impact of XR on manufacturing companies
- Impact of XR on healthy sectors
- Impact of metaverse applications on government, business and academia
- Metaverse and OR applications in the industry
- Metaverse and AI applications in the industry
- Technologies involving metaverse applications
- XR for rehabilitation
- XR for safety and social interaction at work.
- XR for people with serious mobility and verbal communication diseases
- XR for collaborative learning
- System interoperability in metaverse implementations
- Security and privacy in metaverse implementations
- Social effects in metaverse applications
- Collaborative learning within metaverse and virtual worlds
- Virtual and real word interconnectivity

Both theoretical and applied research contributions and real-world application feedback are welcome.

Submission

For author guidelines, please refer to www.ifac-control.org. All papers must be submitted electronically using https://ifac.papercept.net/ and must follow the two-column format in accordance with the IFAC manuscript style. Please use the official IFAC instructions and template to prepare your contribution as a full-length draft paper (6 pages). Submission details are available on the symposium website. There is the possibility to submit discussion papers (limited to 4 pages) that are published in the preprints only. All submissions must be written in English. All articles that comply with the submission guidelines will be peer-reviewed by IPC members. The corresponding author submits the paper online (pdf format) as an open-invitation session paper. **Submission as an invited paper requires the invited session code:** `r1i78`**. Special issues of INCOM 2024 Conference are planned in IFAC and other high-ranking journals.**

IMPORTANT DATES:

Draft paper submission deadline: 31/01/2024

Notification of acceptance: 15/03/2024

Final papers submission deadline: 15/04/2024

Young Author Award Nomination: 15/05/2024

Conference date: 28-30/08/2024

Early registration deadline: 30/04/2024

Late registration deadline: 31/07/2024