TU Wien
Institute for Management Sciences Research
Unit of Industrial Engineering
Research Group of Production and Maintenance Management

Call for Project Work

Preliminary title: Develop a concept for a serious game in Augmented Reality (AR) on asset management and maintenance decision-making

Scientific background: The industrial sector is experiencing rapid data expansion as digitalization becomes increasingly prevalent. Emerging technologies such as blockchain, cloud computing, and augmented reality (AR) are providing critical technical support for this growth. In the semiconductor manufacturing industry, it is essential for manufacturers to share information resources with material suppliers promptly [1]. This necessity arises from the wide variety of products, frequent rework, fast-paced upgrades, and challenging customer demands that characterize the industry. Serious games are proving to be helpful for decision-making policies, offering interactive and engaging ways to improve strategy and efficiency. In this project, we will develop a serious game in AR to support asset management and decision making [2].

Project overview: We are seeking innovative and motivated students to undertake a project aimed at developing a serious game for decision-making and asset management in the semiconductor industry. This game will be developed in augmented reality (AR) using the Microsoft HoloLens 2 and will require a comprehensive understanding of asset management, maintenance decision-making, and AR technologies. The project will combine literature research, game design, and programming in Unity to create an engaging and educational tool for industry professionals.

Tasks: Conduct a review of existing literature on asset management and maintenance decision-making in the semiconductor industry. Explore current applications of augmented reality in gaming and serious gaming. Identify best practices and innovative approaches from existing serious games. Design a serious game in the HoloLens 2, incorporating game mechanics that are educational, engaging, and reflective of real-world challenges, that simulates decision-making and asset management scenarios

Deliverable | Learning Outcomes:

- A detailed 10-page report summarizing the findings from the literature
- A functional prototype of the serious game developed in Unity for the HoloLens 2, including a game design document

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[1] N. Feng, et al. (2023). Computers & Industrial Engineering. How industrial internet platforms guide high-quality information sharing for semiconductor manufacturing? An evolutionary game model.
[2] H. Engström, and P. Backlund. (2021). EAI Endorsed Transactions on Serious games. Serious games design knowledge – Experiences from a decade of serious games development.