

Call for Project Work

Preliminary title: Develop a maintenance decision-support system in Augmented Reality (AR)

Scientific background: Maintenance procedures are becoming data-driven and analysis of failures is even more complex due to the convergence of information technology (IT) and operational technology (OT) systems. Given the increasing complexity failures in assets and limited time for maintenance, troubleshooting procedures are becoming more difficult, requiring technicians to make quick yet reliable decisions. Augmented Reality (AR) is a technology utilized to support maintenance decision-making methods [1]. For the successful use of AR in decision-making support, several factors play a key role, such as structuring and filtering relevant data for the operator, visualizing information, prioritizing task execution, and synthesizing priorities. In this project, we aim to develop an AR decision-making system capable of recognizing a system, utilizing decision-making strategies, and incorporating a learning mechanism that automatically stores maintenance activities and learns from previous procedures.



Fig. 1. Decision-making prototype, print screen captured by HoloLens 2

Project overview: We are seeking innovative and motivated students to undertake a project aimed at developing a maintenance decision-support system in AR. The system will be developed in AR using the Microsoft HoloLens 2. The project will combine literature research on decision-making in maintenance and programming in Unity to create an engaging and educational tool.

Tasks: Conduct a review of existing literature on maintenance decision-making and current applications of AR in decision-making. Identify best practices and innovative approaches from existing applications. Design a decision-support system in the HoloLens 2, incorporating distinct maintenance strategies and a self-learning mechanism while being reflective of real-world challenges.

Deliverable | Learning Outcomes:

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

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