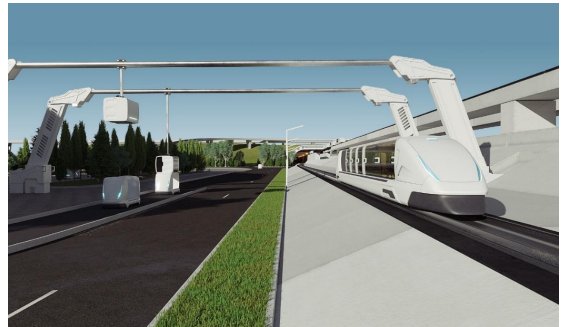


## Enhancing Automated Wagon Handling Systems through Extended Reality



### Problem description

In a combined, multi-modal and automated freight and passenger transportation, an important aspect that needs to be addressed is the transfer of goods and people between modes as well as how their combination will impact the comfort and efficiency. This master's thesis investigates the integration of Extended Reality (XR) technologies to experiment the interaction between passengers, freight and automated wagon handling systems for multi-modal transport. The primary focus is on streamlining the loading and unloading processes, ensuring seamless transfer between different carrier units, providing comfort for passengers, and facilitating efficient transitions between transportation modes. This includes the transfer of wagons between rail and road or between two railway lines as well as loading/unloading of freight en-route. The research will explore the opportunities of XR to explore possible scenarios and relate them to the experience of users by studying the interaction of passengers with the freight and/or operators in different automated handling concepts and/operators.

### Assignment

- Review of the state-of-the-art on automated handling systems and requirements for passenger and freight
- Explore the possible scenarios for the handling system's operations
- Experimental design and execution of VR experiments
- Analyzing the interaction between passengers, freight and automated wagon handling systems.
- Writing a thesis report and optionally a scientific paper for an international journal.

### Candidate

- Knowledge and interest in logistics
- Successfully completed the eXtended Reality for Civil Engineering course (CIEM6304) or have experience in VR or willingness to learn VR
- Experience in Python or R programming for data analysis

### Research group

*Freight and Logistics Lab and Mobility in eXtended Reality (MXR) Lab*  
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