

TOP TEN

Siti Fariya
University of Kent

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AI-Driven Port Traffic Modelling and Simulation for Improved Efficiency

This project employs an innovative approach to analyse port traffic flow for intermodal systems by integrating Artificial Intelligence (AI) with modelling and simulation techniques. At the intersection of growing maritime transport demand and complex port operations, achieving efficiency and reducing congestion is critical. The project's methodology integrates AI with simulation software and ANPR-enabled tracking. AI is able to support decision-making by automating processes, enabling real-time data analysis, and predictive modelling. For example, AI focuses on operations such as loading, unloading, and check-in at the port, and Machine Learning algorithms predict traffic patterns from historical and real-time data. By incorporating AI and digital technologies, a practical strategy to alleviate port congestion is provided, improving throughput.

The project proposes developing an intermodal simulation model for safe, controlled testing alongside AI interventions. At the current stage, there is still much to comprehend about the interaction of these complex systems in real-world applications. This study introduces a clearly defined conceptual framework and conducts a thorough feasibility analysis to understand better the practicality of such an approach considering various elements like costs, technical requirements, and real-world application. Thus, this research pushes the AI application frontiers in maritime logistics, signalling a transformative potential for more intelligent, efficient, and sustainable port operations in the digitalisation era.

