

## ABSTRACT

In today's fast-paced industrial environments, efficiency and reliability in materials handling are crucial for operational success. This project introduces an innovative Automated Guided Vehicle (AGV) system designed to improve logistics and streamline production processes, equipped with advanced task scheduling and battery monitoring capabilities, and leveraging WiFi networking for enhanced connectivity and control.

Existing AGV systems often face challenges in terms of flexibility, task prioritization, and real-time monitoring. Many rely on fixed routes and lack dynamic scheduling capabilities, limiting their adaptability to changing operational demands. Additionally, battery management in current AGV systems is often reactive, leading to unexpected downtime and decreased efficiency.

The proposed AGV system addresses these challenges through the integration of a sophisticated task scheduling module and proactive battery monitoring. The task scheduling system employs advanced algorithms to optimize route planning and task assignment, ensuring timely and precise execution of material transport tasks within the facility. This module adapts to dynamic work environments by considering real-time operational data and prioritizing tasks based on urgency and resource availability.

The proactive battery monitoring system tracks the AGV's power levels in real time, scheduling charging intervals based on battery health and remaining capacity. This approach minimizes downtime and extends the lifespan of the AGV's battery.

Additionally, the AGV's WiFi connectivity enables seamless communication with a central management system, allowing for remote monitoring, updates, and control. This connectivity ensures that the AGV system can integrate with existing infrastructure and other operational systems for holistic management.