RWA3-Group3 Architecture and Activity Diagram

Akash Parmar, Bharat Reddy, Neha Marne, Sai Teja Gilukara, Shantanu Parab
University of Maryland

1. Architecture

1.1. Behavior-Based Control

The Behavior-Based control was selected as it distributes the task in a set of interactive modules(behavior). With multiple AGVs and robotics arms performing the kitting task, behavior-based control parallelizes the procedures to ensure fast task execution at the same time includes the planning stage in the architecture required for ensuring the quality of the task completion.

1.2. Rationales:

- *Simplified Complexity and Risk reduction:* Behavior-Based Control simplifies decision-making and reduces failure risks by separating actions, contrasting with Hybrid Control's serial execution.
- *Quick Adjustment:* Behavior-based control ensures immediate reactions, vital for fast-paced kitting jobs, unlike Hybrid Control, prone to processing lag.
- *Modular Adaptability:* Behavior-Based Control's modularity allows dynamic rerouting for urgent tasks, crucial for sudden high-priority orders.
- *Parallel planning:* Parallel planning ensures task quality while reactive architecture distributes tasks simultaneously for faster completion.

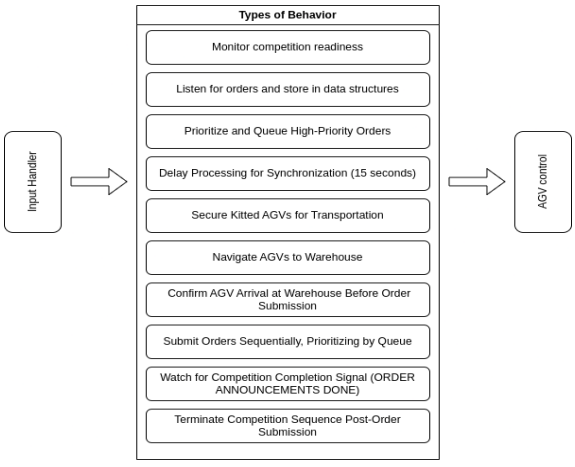

Figure 1. Behavior-Based Control Architecture

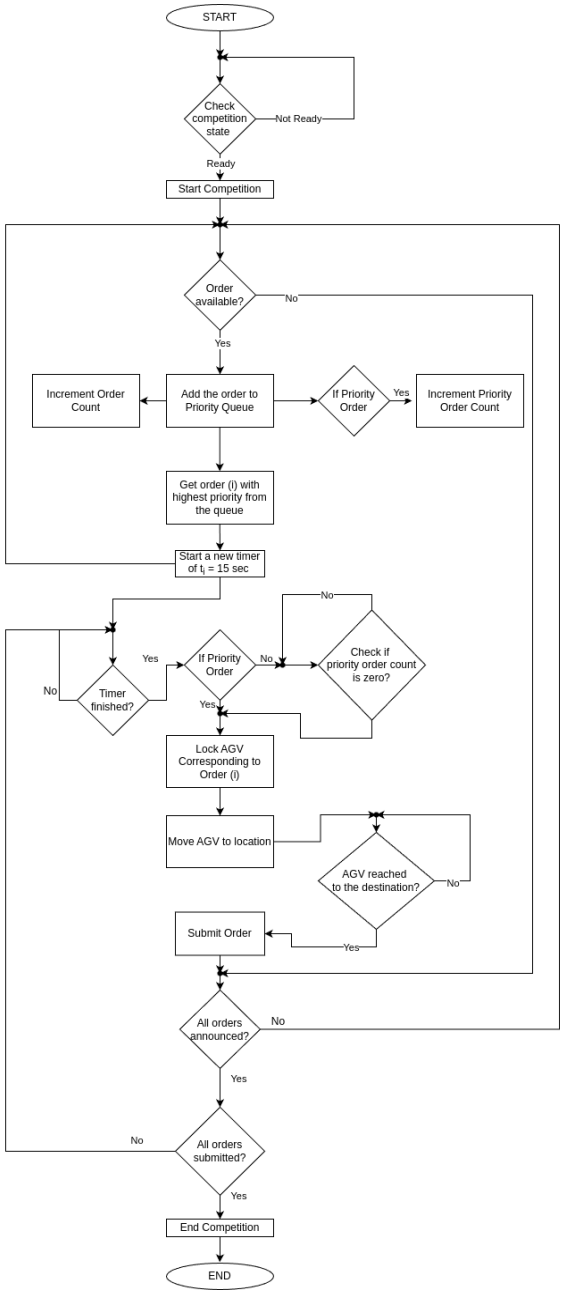

Figure 2. Activity Diagram