

Self-Navigating Gantry Robot for Efficient Warehouse Operations

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This research endeavors to explore the transformative potential of self-navigating gantry robots in optimizing warehouse operations, particularly within the context of the local logistics landscape. In response to the escalating demands for efficiency and precision in modern warehouses, this project responds to inefficiencies and safety concerns in manual material handling within warehouse racks by proposing the development of an autonomous self-navigating robot featuring a *core XY* gantry mechanism. Targeting challenges associated with traditional methods like ladders and forklifts, the project aims to automate loading and unloading processes, enhancing efficiency and safety. The self-navigating robot is designed for precise movements within warehouse racks, optimizing space utilization and ensuring accurate material handling. The user-friendly software interface enables seamless control and monitoring, contributing to real-time space management. This initiative not only addresses immediate challenges in warehouse material handling but also aligns with industry demands for efficiency, safety, and cost-effectiveness. The project anticipates setting new standards in autonomous material handling, fostering a safer, more efficient, and technologically advanced future for warehouse operations.

Keywords: *Autonomous; Core XY; Material handling; Self-navigating robot; Warehouse operation*