

AegelBot: Smart Medicine Delivery Robot

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Abstract

Healthcare environments, particularly isolation wards, require strict infection control while maintaining efficient patient care. This paper presents AegleBot, an IoT-based autonomous medicine delivery robot designed for safe and contactless dispensing within hospital settings. The system employs a Raspberry Pi-driven mobile platform with line-following navigation for reliable indoor mobility. Vision-based ArUco marker detection enables precise patient-bed identification and controlled stopping. An ESP32-controlled dispensing module with stepper-motor-driven rotating compartments ensures accurate medicine release. A web-based interface supports scheduling, monitoring, and remote supervision through cloud integration. Experimental results demonstrate stable navigation, accurate localization, and reliable dispensing performance. By automating routine medicine distribution, AegleBot reduces healthcare workload, minimizes cross-contamination risks, and offers a scalable, cost-effective solution for smart hospital environments.

Keywords

IoT, Healthcare Robotics, Autonomous Navigation, Raspberry Pi, Medicine Dispenser, Computer Vision.