

Development of a Line-Following Robotic Prototype for Medicine and Basic Medical Item Transport in Healthcare Facilities

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Abstract:

Healthcare innovation has become central to the development of modern health systems, offering new ways to address gaps in efficiency, workload management, and access to care. In the Philippines, the shortage of healthcare workers continues to strain nurses, who often balance direct patient care with additional logistical tasks. Exploring practical applications of medical robotics provides one approach to easing these burdens in resource constrained settings. This study introduces Kalinga, a line following robotic assistant designed to transport basic medical items and over-the-counter medicines in school and office clinics. Unlike costly commercial models, the robotic prototype prioritizes simplicity and user friendliness through the use of modular robotics kits and a streamlined design. The study evaluates Kalinga's performance through its success rates. Early development suggests improvements in delivery efficiency and workflow continuity, while allowing nurses to devote more time to patient care. Further investigation of the project is expected to demonstrate how user-friendly service robotics can serve as scalable and practical tools for everyday healthcare environments. By integrating engineering solutions with clinical needs, this research reflects the growing role of service robots in shaping sustainable and modernized innovations.

Keywords:

Line-following Robot, Healthcare Innovation, Logistical Task.