

DESIGN OF AN AUTONOMOUS MOBILE ROBOT FOR SERVICE APPLICATIONS

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ABSTRACT

This research project proposes the development of an autonomous, omnidirectional vehicle that will be used for general indoor service applications. A suggested trial application for this service robot will be to deliver printouts to various network users in their offices. The robot will serve as a technology demonstrator and could later also be used for other tasks in an office, medical or industrial environment. The robot will use Mecanum wheels (also known as Swedish 45° or Ilon wheels) to achieve omnidirectionality. This will be especially useful in the often cramped target environments, because the vehicle effectively has a zero radius turning circle and is able to change direction of motion without changing its pose. Part of the research will also be to investigate a novel propulsion system based on the Mecanum wheel. The robot will form part of a portfolio of service robots that the Mechatronics and Micro Manufacturing (MMM) group at the CSIR is busy developing. Service robots are typically used to perform Dull, Dangerous or Dirty work, where human presence is not essential if the robot can perform the task reliably and successfully.