# **AUTONOMOUS MOBILE ROBOT FOR conventional WHEELCHAIRS TRANSPORTATION IN HEALTHCARE INSTITUTIONS**

# **João Pedro Moreira Faria (jpfaria@ipca.pt) MEEC**

António Herculano de Jesus Moreira (amoreira@ipca.pt)

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**Abstract**

Industry 4.0 presents itself as a new era in which the industry is led by technologies such as robotics, artificial intelligence, and device interconnection. The increasing implementation of robots in industries allows a better quality of service with high accuracy in less time. As a result, these advantages are now in other areas such as medicine or the military to mitigate problems.

In health institutions, the transport of patients is a recurrent, time-consuming, non-ergonomic task and requires the help of assistants. There are solutions such as electric wheelchairs that facilitate patient movement or intelligent wheelchairs that transport patients to their destination autonomously, ~~however, their costs are high, and replacing them with these chairs requires a huge financial effort from the institutions~~ nevertheless, the high costs of these replacement wheelchairs are a financial obstacle for institutions.

This project aims to propose an Autonomous Mobile Robot (AMR) to transport conventional wheelchairs in hospitals, clinics, etc., therefore, wheelchairs are not automated. This robot runningthe Robot Operating System (ROS) will attach itself autonomously to the conventional wheelchair, in a secure, easy, and fast link. The transport request commands will be given to the robot through a central application by the doctor or nurse and will be in constant communication with the institution's management system. This communication is essential to know information such as: which patient is transported, who requests transportation, and the various destinations such as treatment or diagnostic areas, outdoors, etc.

~~This project aims to propose an AMR robot for existing conventional wheelchair transportation in hospitals, clinics, etc. The transport request commands will be given to the robot through a central application by the doctor or nurse and will be in constant communication with the institution's management system. This robot running ROS, will attach itself autonomously to the conventional wheelchair, in a secure, easy, and fast link. Communication with the institution's management system is essential, as sometimes transportation involves a change of floor and, thus, access to elevators is mandatory, since destination may be as diverse as cafeterias, areas of treatment or diagnostic, outdoor, etc.~~

To validate the system will be evaluated the effectiveness of the coupling system to the chair, the efficiency of the patient safety system, and, finally, the efficiency of the application set, management system, and transport system in a set of tests. The expected result of this project will be a ROS-based robotic system to help manage wheelchair transport in health institutions, increasing their availability and reducing the time required for medical personnel in these tasks.

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