

Bachelor's Thesis, Term Project

Autonomous Self-driving disinfection robot: Design, Fabrication and Control

Supervisor (s): (Assist. Prof. Dr. Eng. Amir Roushdy)

Traditionally, advances in robotic technology have been in the manufacturing industry due to the need for collaborative robots. However, this is not the case in the service sectors, especially in the healthcare sector. The lack of emphasis put on the healthcare sector has led to new opportunities in developing service robots that aid patients with illnesses, cognition challenges and disabilities. Furthermore, the COVID-19 pandemic has acted as a catalyst for the development of service robots in the healthcare sector in an attempt to overcome the difficulties and hardships caused by this virus. The use of service robots are advantageous as they not only prevent the spread of infection, and reduce human error but they also allow front-line staff to reduce direct contact, focusing their attention on higher priority tasks and creating separation from direct exposure to infection. **There is a Lab Engineer from the ARATronics Laboratory, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy.**

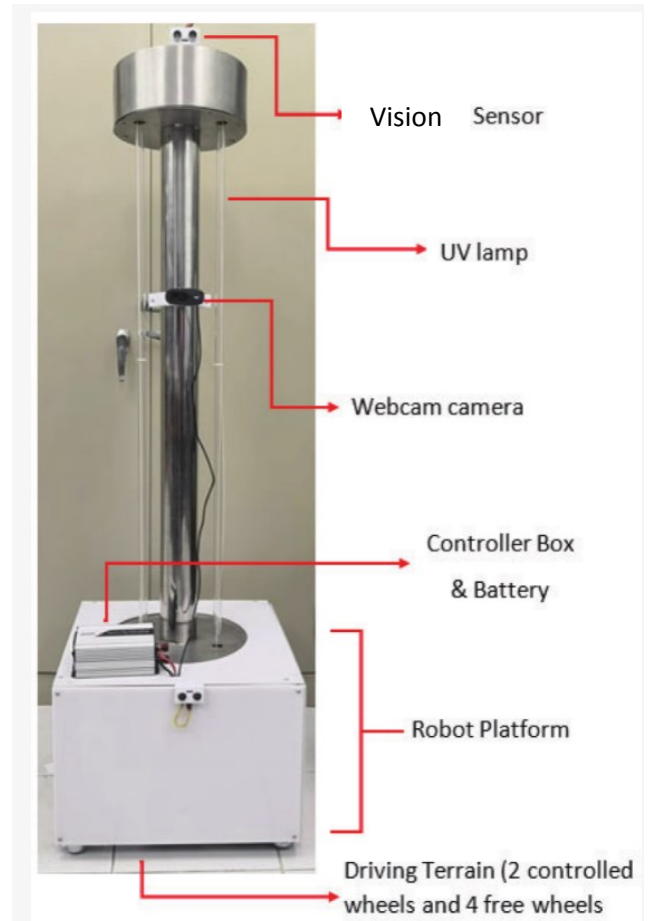


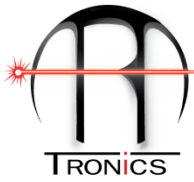
Fig.: Autonomous disinfection robot

Project description and objective:

This project we will investigate the emerging focal issues of effective cleaning, logistics of patients and supplies, reduction of human errors, and remote monitoring of patients to increase system capacity, efficiency, resource equality in hospitals, and related healthcare environments.

For more details please contact:

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Research focus of this project:

- Literature review on the project should be studied properly.
- Not only, creating a software control system for the project but also the hardware.
- Experiments using the gadget and control system should be built properly.
- The outcomes must be documented.

Requirements:

- Passionate to learn more about, Vehicle Dynamics, 3D Printing design, Robotics and control.
- Prior mechatronic design expertise is desired like "SolidWork".
- Enthusiasm for completing actual practical work with 3D printing staff (design fabrication and construction).
- A method of working that is both structured and self-contained.

General tasks of the project:

- The complete methodology is already available in the ARATRONICS Lab, so we will discuss it from the first day to start the automation process for it
- Fabricate the robot/system using 3D printer/CNC machine (small parts).
- Assembly all parts of the Robot.
- Changing the working variables and see the effect on the locomotion of the robot.

Other notes:

- A weekly meeting with the advisors will be required for this project, as well as weekly progress updates (*The meeting could be more than once during the week based on your progress and based on your achievements*).
- You should to be in the Lab two days per week (*It could be more than two days based on your progress and based on your achievements*).
- All reports must be prepared in the style of a research paper.
- The outcome of this research will be published in one of the coming international Conferences and , or Journal