

Bachelor's Thesis, Term Project

Design, Fabrication and Control for a Pipeline Inspection Robot

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

In this project, we are going to build a uniquely designed track driven robot. It is designed to inspect, clean and repair ducts & pipes, especially in cases when dismantling the system is strenuous or impossible. It also could work for drilling inside the Great Pyramid where the robot also can be sent to explore beyond a mysterious stone seal inside the Great Pyramid of Giza in Egypt, to unlocked one mystery only to reveal another. We can add LIDAR at the tip so we can use it for inspection of the cracks inside the tubes. **There is a Lab Engineer from ARATRONICS, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy.**



Fig.: A Pipeline Inspection Robot

Project description and objective:

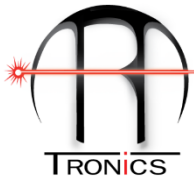
This project is organized as follows. The mechanical design of the Robot should be the first part of the project. Then we will describe the results of performance evaluation including the workspace, maximum velocity, and trajectory tracking. Finally, Build a prototype for the pipeline and then test the robot and its locomotion on it.

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.

For more details please contact:

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- Experiments using the gadget and control system should be built properly.
- The outcomes must be documented.

Requirements:

- Passionate to learn more about 3D Printing design, Robotics and control.
- Prior mechatronic design expertise is desired like “SolidWork and Arduino”.
- 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 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