

Bachelor's Thesis, Term Project

LiDAR Sensing Technology for Controlling the Quadruped Robot Locomotor

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

LiDAR technology lets a robot function in unfamiliar and unpredictable settings. LiDAR offers high-resolution, 3D information about a robot's surroundings, including information about objects and people. LiDAR can identify both the presence of an object and determine if it is a person. That will help the 4 legged robot to operate outside in a controlled situations. In this project you will work with another students who will get to work with the fabrication of the 4 legged robot itself. **There is a senior's student from Mechatronics engineering Department and the Lab Engineer from ARATRONICS, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy.**



Fig.: Navigation Feedback control for the 4 Legged Robot Locomotor based on the LiDAR Technology

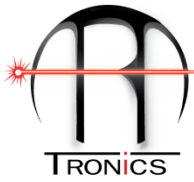
Project description and objective:

Lidar is an acronym for "light detection and ranging." It is sometimes called "laser scanning" or "3D scanning." The technology uses eye-safe laser beams to create a 3D representation of the surveyed environment. A typical LiDAR sensor emits pulsed light waves into the surrounding environment. We will use this technology to navigate the position of the 4 legged robot.

Research focus of this project:

For more details please contact:

Assist. Prof. Dr. Eng. Amir Roushdy, Room: C7.108, E-mail: amir.ali@guc.edu.eg, Web site: www.aratronics.com



- 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 3D Printing design, Robotics, Raspberry pi 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 machine/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