

Bachelor's Thesis, Term Project

Four Legged Robot on Wheels Can Walk Like a Human and Drive Like a Car

Main Advisor(s): (Assoc. Prof. Dr. Eng. Amir Roushdy)

Co-Advisor(s): (Eng. Abdelrahman Ibrahim, Eng. Malek Mahmoud)

For legged robots, motorized wheels offer a number of significant advantages over feet. Locked wheels can behave similarly to point feet, and unlocking them gives legged robots the ability to travel both faster and more efficiently. To commercialize wheel-legged robots for a wide variety of tasks including mapping, inspection, disaster relief, and logistics in urban environments, to name a few. **There is a Master's student from Mechatronics Engineering Department, Senior Researchers from ARAtronics also available to help and advice and The Lab Engineer from ARAtronics, guiding and directing the student with Assoc. Prof. Dr. Eng. Amir Roushdy.**



Fig.: Four Legged Robot on Wheels that would be add to the typical Legged Robot at the ARAtronics Research Center

Project description and objective:

In this project, a 1:1 scale biped leg for a Four Legged Robot on Wheels must be modelled, drawn and assembled for the already existing robot that we do have in our lab.

Research focus of this project:

- Literature review on the project should be studied properly.
- Creating a 3D Model of the model for the project and the hardware.
- Some experiments on the model and control system should be conducted and built properly.
- The outcomes must be documented.

Requirements:

- Passionate to learn more about 3D Printing design, Robotics and control.

For more details, please contact:

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- 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 machine/system using 3D printer/CNC machine .
- 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 project will be publish into one of the coming international conferences/journals.