

Bachelor's Thesis, Term Project

A Rotary Stewart Platform Robot: Control, Design and Fabrication

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

The purpose of this project is to involve the design and programming of a six-degree of freedom parallel robot, also known as a Stewart Platform or hexapod. This robot is intended for use in machining operations, to create complex geometries, without the need for a large and costly CNC machine. **There is a Master's student from Mechatronics engineering Department and the Lab Engineer from ARATRONICS, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy.**

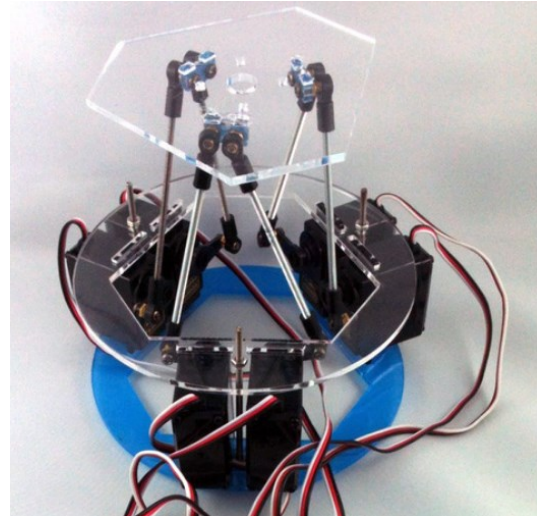
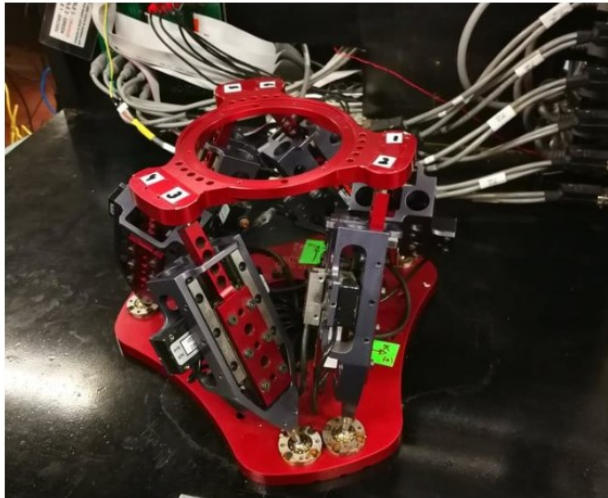


Fig.: Stewart Platform or Hexapod Robot

Project description and objective:

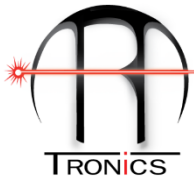
The Stewart Platform is a common type of parallel manipulator and possesses six degrees of freedom. In this project we will present the the generic Stewart-Gough platform is composed of two rigid bodies connected through a number of prismatic actuators as in a parallel arrangement of kinematic chains. Usually six actuators are used, pairing arbitrary points in the two bodies.

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.

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



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 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