ARAtronics Research Center for
Opto-Mechatronics Engineering

ARAtronics Research Center,
Mechatronics Engineering Department,
Faculty of Engineering and Material Sciences (EMS),
The German University in Cairo (GUC)

Bachelor's Thesis, Term Project

Mechanical 3D Printed Design, Fabrication and Control of Humanoid Robot Platform

Supervisor (s): (**Assist. Prof. Dr. Eng.** Amir Roushdy) and (**Prof. Dr. Eng.** Imam Morgan)

Design, Fabrication development, and motion planning of a Humanoid Robot, Mechanical design will be the main topics that should be covered in this project. The design concept, lower body design, upper body design and actuator selection of joints are included in this project. **There is a Master's student from Mechatronics engineering Department and ARAtronics Lab Engineer, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy and Prof. Dr. Eng. Imam Morgan.**

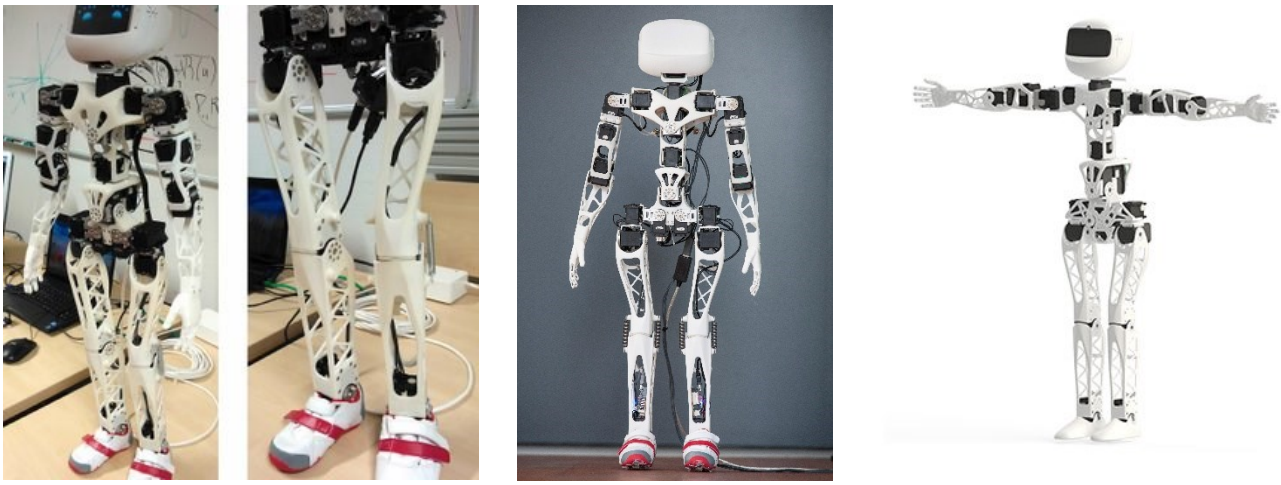

Fig.: 3D Printed Humanoid Robot

Project description and objective:

The research on humanoid robots has gained a particular interest in this new phase as humanoids tend to change the concept of the robot. In the past, robots were confined to the industry carrying out such jobs as welding, and parts-assembly (automobile and electronic devices) in that the objectives, specification and optimal design parameters were clearly defined with concern to the economic aspects, productivity and efficiency. By today, it has come to a situation, where the robot should be able to perform a wide variety of functions that helps people in their daily life.

Research focus of this project:

- Literature review on the project should be studied properly.

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

- 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 robotics, automation 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:

- ARAtronics will support you with the CAD robot design on Solidwork. You, will adjust some parts on the design to fit with the motors and actuators.
- Fabricate the robot using 3D printer.
- Assembly all parts of the robot.
- Motion control study for 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

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