

Yousef Emam

ROBOTICS PHD STUDENT

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Education

Georgia Institute of Technology

Atlanta, GA

PHD IN ROBOTICS

Aug 2018 - Est. May 2022

- Advisor: Dr. Magnus Egerstedt.
- Current GPA: 4.0/4.0

Georgia Institute of Technology

Atlanta, GA

MASTERS IN COMPUTER SCIENCE

Aug 2018 - Est. May 2020

- Specialization: Machine Learning.
- Current GPA: 4.0/4.0

Georgia Institute of Technology

Atlanta, GA

B.S. IN MECHANICAL ENGINEERING

Aug 2014 - May 2018

- Honors: *summa cum laude*.
- Focus on Automation and Robotic Systems.

Experience

Siemens

May 2019 - Aug 2019

GRADUATE INTERN - AUTOMATIC PLANNING & SCHEDULING FOR AUTONOMOUS SYSTEMS

Princeton, NJ

- Extended Siemens' Receding Horizon Planner (RHP), a scheduling algorithm, to teaming tasks & heterogeneous teams of agents.
- Created a simulator inspired by a Search & Rescue scenario where fires are to be extinguished & victims are to be discovered & rescued.
- Improved scheduler by creating an alternative tree-search method in C++.

GRITS Lab

Atlanta, GA

UNDERGRADUATE RESEARCH ASSISTANT

Jan 2017 - May 2018

- Designed and prototyped sloth-like robots to be deployed in the Atlanta botanical garden for environmental monitoring.
- Implemented variations of Boids algorithm on swarms of up to 25 robots (GRITSBots) to simulate herd behavior.
- Built wireless charging stations for the first remotely accessible swarm robotics research platform Robotarium.

Georgia Institute of Technology

Atlanta, GA

SENIOR DESIGN PROJECT

Jan 2018 - May 2018

- Won the best Mechanical Engineering Project Award for creating a Compact Active Response Gravity Offload System (CARGOS).
- System to be mounted on NASA's ARGOS to improve their astronauts' reduced-gravity training experience.
- Implemented the GUI & the feedback loop using a PID controller.

European Organization for Nuclear Research (CERN)

Geneva, Switzerland

SUPERCONDUCTOR & DEVICES (SCD) INTERN

May 2017 - June 2017

- Conducted a review surveying options for the superconducting MgB_2 lines' thermal sensor feeding the Large Hadron Collider's (LHC's) new magnets.
- Performed stress-strain & thermal expansion analysis on a variety of Nb_3Sn superconducting wires.

Exposure Controlled Projection Lithography (ECPL) Systems Lab

Atlanta, GA

RESEARCH ASSISTANT

Jan 2016 - May 2016

- Designed lenses using Exposure Controlled Projection Lithography.
- Formulated an automated post-curing process to improve lens-curing.
- Improved the process-planning & simulation processes.

Publications

JOURNAL ARTICLES

- [J1] G. Notomista, **Y. Emam**, M. Egerstedt. "The SlothBot: A Novel Design for a Wire-Traversing Robot". *2019 IEEE Robotics and Automation Letters (RA-L)*.

CONFERENCE PAPERS

- [C1] **Y. Emam**, S. Wilson, M. Hakenberg, U. Muenz, M. Egerstedt. "A Receding Horizon Scheduling Approach for Search & Rescue Scenarios". *2020 IFAC World Congress*.
- [C2] **Y. Emam**, S. Mayya, G. Notomista, A. Bohannon, M. Egerstedt. "Adaptive Allocation for Heterogeneous Multi-Robot Teams with Evolving and Unknown Robot Capabilities". *2020 IEEE International Conference on Robotics and Automation (ICRA)*.
- [C3] **Y. Emam**, P. Glotfelter, M. Egerstedt. "Robust Barrier Functions for a Fully Autonomous, Remotely Accessible Swarm-Robotics Testbed". *2019 IEEE Conference on Decision and Control (CDC)*.

Skills

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|-----------------------------|---|
| Programming | Python, MATLAB, JAVA, C++, ROS, Arduino, LabView, CAD |
| Manufacturing Skills | 3D Printing, Metal & Woodworking, Soldering, Laserjet, Waterjet |
| Languages | Arabic, French, English |
| Relevant Coursework | Linear/Non-Linear Systems & Control, Optimal Estimation, Optimal Control, Network Control, Reinforcement Learning, Deep Learning, Artificial Intelligence, Computer Vision. |

Leadership & Outreach

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| 2015-2016 University Lab Instructor , GT Invention Studio | <i>Atlanta, GA</i> |
| 2015-2016 Vice-President , GT Arab Student Organization | <i>Atlanta, GA</i> |
| 2015-2015 I-Natural Team , GT Vertically Integrated Projects | <i>Atlanta, GA</i> |
| 2014-2015 Nicaragua Technical Committee , GT Engineers without Borders | <i>Atlanta, GA</i> |