

Ali Ibrahim A Albazroun

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Education

University of Illinois at Urbana-Champaign (UIUC)

PhD in Mechanical Engineering

2022-present, GPA: 3.77

Concentration : Computational Science and Engineering

Relevant Coursework: Numerical Analysis, Control System Theory & Design, Computational Design & Dynamics of Soft Systems, Optimization in Computer Vision, Interactive Computer Graphics.

BS in Mechanical Engineering & BSLAS in Mathematics

2018-2022, GPA: 3.90

Relevant Coursework: Robot Dynamics & Control, Mechatronics, Humanoid Robotics, Principles of Safe Autonomy, Computational Mechanics, Nonlinear Programming, Intro to Machine Perception.

Research Experience

Graduate Research Assistant

Gazzola Lab, UIUC

2022 - present

Advisor: Mattia Gazzola

- Extended the capability of the open-source software PyElastica for simulating assemblies of Cosserat rods to include contact with imported triangular meshes.
- Modeled and simulated twisted and coiled polymer actuators using Cosserat rod theory and PyElastica, and validated models with experimental data.
- Trained RL policies using PyTorch for limbless navigation on heterogeneous 3D terrains.

Undergraduate Research Assistant

Bretl Research Group, UIUC

2019 - 2022

Mentors: David Hanley and Timothy Bretl

- Designed PCBs and parts for a data collection rig used for a Magnetic Positioning Indoor Estimation (MagPIE) Dataset.

Research Intern

Integrated Circuits and Systems Group, KAUST

Summer 2021

Mentors: Hussein Hussein and Hossein Fariborzi

- Developed forward and inverse kinematic models for a V-shape actuator-based micro-robot leg, and experimentally validated models using a probe station.

Research Scholar

DASLAB, Discovery Partners Institute

Spring 2021

Mentors: Sri Theja Vuppala and Girish Chowdhary

- Selected computers, sensors, and actuators to automate a tractor.
- Installed operating systems and set up ROS on the computers for communication and collecting sensor data.

Summer Scholar

IRIS, Carnegie Mellon University Robotics Institute

Summer 2020

Mentors: Connor Colombo, Raewyn Duvall, and William (Red) Whittaker

- Developed a rock detection method for localization purposes using edge detection and superpixels, and implemented it in MATLAB.

Teaching Experience

Graduate Teaching Assistant

ME 370: Mechanical Design I, UIUC

Spring 2023 & Fall 2024

- Directed mechanical design labs for 80+ students across 5 lab sections.
- Prepared lab materials, held office hours and graded student presentations and reports.

Publications

1. Zhang, [Albazroun](#), Wang, Mehta, Gazzola. Navigation of slithering bodies on 3D, heterogeneous terrain through bio-inspired sensing and physics-informed learning, [Submitted to Advanced Intelligent Systems](#)
2. H. Hussein, [A. A. Bazroun](#) and H. Fariborzi. Microrobotic Leg With Expanded Planar Workspace, [IEEE Robotics and Automation Letters](#), 2022.
3. [A. Albazroun](#), R. Duvall, and W. L. Whittaker. Rock Detection and Accurate Boundary Localization Through Non-Learning Based Superpixel Optimization. [CMU Robotics Institute Summer Scholars Working Papers Journal](#), 2020

Skills

Programming:	Python, MATLAB, C++, ROS, Javascript
Libraries:	NumPy, SciPy, matplotlib, Three.js
Machine Learning:	PyTorch, TensorFlow
Markup:	Latex, Markdown, HTML5, CSS
CAD:	PTC Creo, SOLIDWORKS, Autodesk Fusion 360
EDA:	Autodesk EAGLE, Cadence OrCAD