

# Mishek Jair Musa

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Portfolio Website: [mjmusa.github.io](https://mjmusa.github.io) | LinkedIn: [linkedin.com/in/mishekmusa/](https://linkedin.com/in/mishekmusa/)

## EDUCATION

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### PhD in Mechanical Engineering

Anticipated December 2024

University of Arkansas, Fayetteville, AR

GPA: 3.93

Supervisor: Prof. Uche Wejinya

### Master of Science in Mechanical Engineering

December 2021

University of Arkansas, Fayetteville, AR

GPA: 3.92

Supervisor: Prof. Yue Chen (now at Georgia Tech)

Thesis Title: Respiratory Compensated Robot for Liver Cancer Treatment

### Bachelor of Science in Mechanical Engineering

May 2019

University of Arkansas, Fayetteville, AR

GPA: 3.64

Minor: Mathematics

## ENGINEERING EXPERIENCE

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### Doctoral Researcher and Teaching Assistant

January 2022 – Present

University of Arkansas, Fayetteville, AR

- Developing a modular two-wheeled balancing mobile robotic platform to test novel control system strategies such as hierarchical sliding mode control, adaptive control, and reinforcement learning based control.
- Designing and fabricating PVDF and graphene based micro-actuators with optimized closed-loop control schemes for implementation in micromanipulation systems.
- Instructing and developing the laboratory segment of a fundamental mechanical engineering course on the functioning and design of mechatronic systems and their integration with Arduino microcontrollers.

### Master's Researcher and Teaching Assistant

June 2019 – December 2021

University of Arkansas, Fayetteville, AR

- Designed and prototyped several medical robotic devices for percutaneous needle insertion procedures under intraoperative image-guidance such as MRI and CT.
- Developed a novel soft robotic sensing pad for head motion detection in the MRI environment that utilizes a machine learning algorithm to relate pressure readouts from the sensing pad to angular displacements of a patient's head.
- Authored 6 journal papers and 4 conference papers and assisted in the writing of several grants and proposals.
- Supervised 6 undergraduate students conducting senior design projects and undergraduate honors research.

### Lead Mechanical Engineer

August 2018 – May 2019

University of Arkansas Razorbotz, Fayetteville, AR

- Lead mechanical engineer for the excavation subsystem team for the NASA Robotics Mining Competition Team
- Supervised a team of 10 fellow undergraduate mechanical engineers.
- Designed and built a functioning robot to perform excavation tasks in a simulated Martian environment.

## SKILLS

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**Software:** SolidWorks, Autodesk Fusion 360, Autodesk Inventor, EAGLE, Microsoft Office Suite, LaTeX, Blender, GIMP

**Programming Tools & Languages:** MATLAB & Simulink, Python, Arduino IDE, Raspberry Pi, ROS, Machine Learning/Deep Learning Packages (Pytorch, TensorFlow, Scikit-Learn), Git, OpenCV, LabView, NVIDIA Jetson Nano, C++, HTML5, Robot Programming (robot models: UR10, UR10e, Frank Emika Panda)

**Manufacturing:** Additive Manufacturing (FDM, SLA, and SLS 3D printing), Milling (CNC and Manual), Lathe (Manual), Hand Tools, Power Tools, Soft Robot Fabrication, Laser Cutting, PCB design

**Language:** English (fluent), Belizean Creole (fluent), Spanish (conversational)

## CERTIFICATIONS/AWARDS

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- Certified SolidWorks Associate – License C-NUA8W3Y8QZ
- Reginald R. "Barney" & Jameson A. Baxter Graduate Fellowship (2023 – 2024)
- 21<sup>st</sup> Century Leadership Chair in Engineering II – Mechanical Engineering Fellowship (2022 – 2023)
- W.R. Thomas Endowed Graduate Fellowship (2022 – 2023)