

Mohamed Aziz Medhioub

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EDUCATION

Vanderbilt University. Nashville, Tennessee, USA. *Junior*

August 2020-May 2024

Bachelor of Engineering in Mechanical Engineering. GPA cumulative: 3.2

SKILLS

Technical Skills: Design: 3DExperience, SolidWorks, Python, CAN, PCAN Explorer, MATLAB, Data Acquisition, Onshape, Fusion 360, Workbench Ansys for FEA Analysis, COMSOL Physics for Fluid Dynamics.
Prototyping/Fabrication: 3D printing (Plastics and Resin), Laser cutting, Soldering, Mechatronics, Conventional Milling, Band Saw, Lathe, Woodworking Tools, Hand Tools.

Programming: Python and C for Microcontrollers | **Creativity and Task management:** Adobe Lightroom, Adobe Premier, Jira Program Management Software | **Language Skills:** English, French & Arabic.

EXPERIENCE

Tesla Motors. Palo Alto, California, USA.

May 2023 – Aug 2023

Robotics – Hardware Engineering.

- Designed, built, and programmed a custom test setup for initial cycling and reliability testing of Tesla actuators for Tesla bot development.
- Programmed servo motors, implemented proximity sensors, load cells, and other off the shelf components to integrate with actuator setup and other test setups to improve reliability of test equipment.
- Brought up cyclic testers on Raspberry PI OS/Ubuntu paired with LabJack DAQs, and servo motors position control for dedicated continual operation of test machines.
- Regularly interacted with larger robotics team from design to system integration to understand systems and implement realistic conditions and appropriate parameters for test setups.
- Developed standardized python scripts with DAQ systems to control off the shelf motors. Utilized python to collect and store analog data from sensors such as load cells, proximity sensors, Wire harnesses, and stepper motors. Created procedures and documentation for efficient replication of test setups in the future.
- Developed MATLAB scripts that rapidly analyze multiple files of collected data and generate plots that clearly explain the results of the test.
- Interacted with industrial equipment/test equipment and Tesla equipment utilizing the following communication and data protocols CAN FD, CAN, RS232, RS485/422. Implemented python solutions for 10-byte hex-based communication system to control 3rd party motors in Torque or Velocity mode.

Mechatronics I, Nashville, Tennessee, USA

March 2023 – May 2023

Student – Independent Project.

- Personally designed, built, programmed, and tested a smart Safe Porch Delivery Cabinet with internet connectivity and built-in notification system. Build from the ground up with basic repurposed components from university labs and maker spaces.
- System operated via RFID card reader and an Electromagnetic lock that disengaged when correct tag was brought up to the reader. LCD screen used to display short messages for user, Lithium-Ion Batteries used to maintain on board power, and Teensy 4.1 dev board used for all actuation/sensor interaction. ESP8266 low cost WIFI Board used for internet connectivity to send e-mails notification to user.

Dong Lab – Miniature Robotics Laboratory. Nashville, Tennessee, USA.

Aug 2022 – Jan 2023

Undergraduate Research Student.

- Worked on 5 degree of freedom mini rover that carries a magnetic field source. Rover was placed inside X-Ray cabinet and used to actuate magnetic particles while X-rays images are taken. The rover frame had to be stiff but not made of steel to not reflect x-ray particles.
- Used Arduino DUE board to communicate with DC motors drivers for in-plane translation (x and y) and rotation (z-axis) of the rover omni wheels.
- Used Step motor drivers to control z-axis translation using ball screw system.
- Created simple LabVIEW interface to interact with the rover using keypad inputs.

Tesla Motors. Fremont, California, USA.

May 2022 – Aug 2022

Solar Roof- Test and Reliability Engineering.

- Redesigned and rebuilt a Water Ingress test setup for Solar Roof product components.
- Programmed Flowmeter sensors, relay units (for water pump control), and Advanced Live LCD display of flow data.
- Increased the system capacity by 25% and added the capability of flow control and measurement replicating multiple rain scenarios for different regions in the US.
- Improved the process of loading and unloading samples to the test setup and eliminated false positives, leading to 10 hours/week saved from test re-runs.
- Completed the Water Ingress test setup with 40% savings from the original budget.
- Fully documented the project design, physical build, mechatronics circuit.

The SyBBure Searle Undergraduate Research Program. Nashville, Tennessee, USA.

Jan 2021 – Present

Scholar.

- Admitted into a University Sponsored Research Program and awarded \$8K in living expenses.
- Gained leadership experience as Lab space guardian. Performed regular maintenance on lab equipment. Trained 20 students on using 3D printers, laser cutters, soldering station and other tools for rapid prototyping.
- Developed skills in Python and C, mechatronics, and RC communication through team-based projects.
- Built FPV (first person view) drone capable of carrying action camera to film unique angles around university campus. Gained familiarity with flight software such as Betaflight and hardware components such as ESCs, and flight Boards.
- Used a CNC router to carve wood for a tabletop arcade machine.
- Built an RC plane using different mechatronics components to learn more about dynamics of flight. Learnt about RF communication protocols and different international standards.

Robotics and Autonomous Systems Lab. Nashville, Tennessee, USA.

Feb 2021 – Jan 2022

Undergraduate Research Student.

- Learned how to use SolidWorks to draw parts and create assemblies for test setups. Tasked to design and build a test setup meant to apply force on a user's wrist to match the user's experience within Augmented Reality.
- Used different rapid prototyping techniques such as 3D printing and laser cutting as well as machining techniques such as milling to create all parts required for assembly.
- Designed control system from a combination of Maxon EC motor, encoder, and gear box to achieve a specific torque output.