Aron Wilson Mathias

Arizona, AZ | www.linkedin.com/in/am8466|520-2035971 |aromathias@arizona.edu|

EDUCATION

•University Of Arizona **Arizona, AZ**
ME in Robotics and Automation *Graduation Date: May 2025*
Relevant Coursework: Design of Mechatronics System, Introduction to Advanced Control Theory, Robot Operating System, Non-linear and Optimal Control, Introductory Robotics: Kinematics, Dynamics and Path Planning, Introduction to Machine learning, Principles of Artificial Intelligence

•SRM Institute of Science and Technology **Kattankulathur ,India**
B-Tech-Mechatronics Engineering *Aug 2018- May 2022*
Relevant Coursework: Fundamentals of Robotics, Systems Engineering, Microcontrollers and Embedded systems, Power electronics and Drivers, Elements of Mechatronics System, Microprocessors, Sensors and Signal

WORK EXPERIENCE

•University of Arizona **Arizona, AZ**
Research Assistant *Jan 2023 – Present*
Quadcopter Guided by Quadruped: Developed a quadcopter with **configurable motion**, integrating sensors and **control algorithms** for stable and precise operation.
Deformable Continuum UAV: **Designed a deformable UAV** for **enhanced maneuverability**, with **control algorithms** ensuring stability and **extensive performance** testing.
Deformable Ground Unit: Built three omni-directional robots with **deformable structures** for **safety** and **defense** applications.

•Internshipwala Careers **Mumbai, India**
Robotics Technician-Industrial Safety *July 2021 – August 2021*
Ensured compliance with **safety protocols and regulations** in the **robotics field**, safeguarding workers, equipment, and **environments during robotic system operations.**
Identified potential hazards and implemented **risk mitigation strategies** to maintain a safe and efficient workplace.

•Fareast Marine Services India Private Limited **Mumbai, India**
Technical Assistant *November 2019 - December 2020*
Diagnosed and resolved technical issues in robotic systems, ensuring smooth operation and reliability of critical components.
Collaborated on troubleshooting complex mechanical failures, such as motor and actuator malfunctions, to optimize system performance.

RESEARCH PROJECTS/ACADEMIC PROJECTS

•Deformable Ground Unit (DGU) (University of Arizona -TLA)
Engineered and implemented a Deformable Ground Unit (DGU) utilizing **affine transformations**, **ROS as the operating system**, and **Python** for **control and automation.**
Spearheaded the design, prototyping, and **integration of modular components**, integrating ROS-based frameworks to enhance **mobility and adaptability** in deformable robotic systems.

•Deformable Continuum UAV (DCU) (University of Arizona-TLA)
Created and **optimized three UAVs** with a deformable **continuum** structure, improving maneuverability and stability through innovative control algorithms.
Developed and validated control systems for **structural deformation**, ensuring optimal **performance under diverse conditions**.

•Quadcopter Team Configurable Motion Guided by a Quadruped(University of Arizona)
Engineered a **quadcopter** with configurable motion, guided by a quadruped robot, integrating sensor data and control algorithms to enhance stability.
Collaborated with a team **to optimize** the quadcopter's performance across **diverse environments**.

•Autonomous Rover Navigation System Using Modular ROS Nodes
Constructed a modular navigation system **for an autonomous rover using** ROS **and** Python**, integrating** LiDAR**,** dead reckoning**, and** motion control nodes**.**
Implemented algorithms **for** real-time obstacle avoidance **and** trajectory tracking**, ensuring precise and efficient rover navigation.**

•Fabrication of Animatronics Hand
Designed and **fabricated** a fully functional Animatronic Hand using **Arduino UNO** and servo motors, **integrating flex sensors** for precise motion replication.
Implemented a cost-effective solution with innovative hardware strategies to mimic human hand movements, emphasizing safety and efficiency.
Overcame technical challenges through rigorous **troubleshooting** and calibration, delivering a reliable prototype applicable in **medical and industrial robotics.**

•Smart integrated Mobility Solution Transportation
Built an **AI-powered transportation** platform leveraging Python, Google Maps API, and NetworkX, resulting in a **20% reduction** in travel time.
Created a scalable, **multi-modal system** with real-time data insights, improving user **accessibility and enhancing decision-making process**

PUBLICATION

- M. Ghufran, S. Tetakayala, A. Mathias, J. Hughes and H. Rastgoftar, **"Quadcopter Team Congurable Motion Guided by a Quadruped,"** 2024 18th International Conference on Control, Automation, Robotics and Vision **(ICARCV),** 2024, Accepted for Publication

SKILLS

Programming: Python, C++, C, HTML, MATLAB,Simulink, Robot Operating System (ROS), Machine Learning

Software: SOLIDWORKS, Fusion 360, AutoCAD, ANSYS, Adobe Creative Cloud, ROS

Tools & Skills: CAD Modelling, Data Analysis, 3D-Printing, Casting, Soldering, Lathes