Michael H. Gross

mgrossofficial@gmail.com | (520) 419–9061 | linkedin.com/in/mhgross | github.com/MGross21

SUMMARY

Robotics software engineer with expertise in perception, planning, control and embedded systems. Experienced across the full mechatronics stack, ranging from low-level firmware and hardware interfaces to high-level libraries and frameworks. Dedicated to delivering modular and scalable solutions that advance robotics in product development and deployment.

EDUCATION

Arizona State University, Mesa, AZ
Robotics and Autonomous Systems, *M.S.* — *with Distinction* — 4.0 GPA
Robotics Engineering, *B.S.E.*; Minor in Applied Mathematics — *Summa Cum Laude* — 4.0 GPA

SKILLS

Languages & Frameworks: Python, C/C++, Rust, MATLAB, ROS2, OpenCV, MuJoCo, Gazebo
Tools & Systems: Git, Docker, CI/CD, Linux (Ubuntu, Arch), Embedded Systems, SPI, I2C, UART, PCB Design
CAD & Fabrication: SolidWorks, Fusion 360, KiCad, Cadence, 3D Printing, CNC Machining, Laser Cutting, Soldering

EXPERIENCE

ASU Robotics and Autonomous Systems Lab, Mesa, AZ — Aug 2024 — July 2025
Graduate Research Assistant

- Developed armctl, a vendor-agnostic Python API controlling industrial robotic arms such as UR, Vention, and Elephant Robotics; achieved around 15 ms latency and removed redundant platform-specific drivers
- Created mujoco-toolbox, a MuJoCo-based digital twin toolkit with XML/URDF merging, inverse kinematics, and trajectory generation; supported reinforcement learning and reproducible closed-loop experiments
- Integrated trajectory optimization, sensor fusion, and adaptive control into cohesive pipelines; demonstrated effectiveness on multi-robot coordination in cluttered and dynamic settings
- Implemented containerized CI/CD workflows that standardized benchmarking, reduced configuration overhead, and increased reliability across research deployments

Precision Planting (An AGCO Company), Fargo, ND — May — Aug 2024
Research & Development Intern

- Designed lab-based testing fixtures using Creo & 3D printing to replicate extreme field usage for developmental sensors
- Developed data-cleaning algorithms for optical seeder sensor field data; analysis showed 10% lower detection variance than competitor products, projecting multi-million-dollar savings
- Integrated embedded sensors into the CAN bus with custom drivers, improving compatibility and future development

PROJECTS

Robotic Glovebox Digital Twin | Los Alamos National Labs — Aug 2024 — Jul 2025

- Built robotic arm digital twin for hazardous glovebox operations with computer vision, motion planning, and control
- Applied deep learning detection with fiducial marker sensor fusion for robust tracking under occlusion/limited visibility
- Optimized path planning for confined workcells, improving accuracy and reliability in high-risk environments

Parkinson's Rehabilitation Device | Barrow Neurological Institute — Jan — May 2025

- Engineered wearable medical robotics system with IMU and gyroscopic sensors, Bluetooth Low Energy streaming, and interactive GUI; achieved less than 50 ms real-time sensor-to-actuator feedback loop for vibrotactile therapy exercises.
- Developed firmware and embedded systems control for responsive rehabilitation applications

Turtlebot4 Predator-Prey Model | Arizona State University — Jan — May 2025

- Built ROS2 nodes for SLAM, computer vision detection, sensor fusion, and localization to enable autonomous navigation
- Designed and tested policy models and motion planning for pursuit-evasion in cluttered environments

Frog Gait Reproduction | Arizona State University — Aug — Dec 2024

- Developed a foldable bio-inspired robotic frog; modeled limb motion and optimized material parameters for locomotion.

Tilt-Up Window Automation | Summit Automation — Aug 2023 — May 2024

- Developed 400 lb IoT device with linear actuators, embedded control, and custom PCB; delivered commercially

Smart Umbrella for Wheelchairs | Arizona State University — Jan — May 2023

- Designed a motorized canopy with real-time climate sensor control; implemented custom PCB and mounted housing

Edge Mapping Evaluation | Arizona State University — Aug — Dec 2022

- Evaluated edge detection operators and trained CNNs on 60k+ images for autonomous vehicle detection in MATLAB

LEADERSHIP & ACTIVITIES

FIRST Tech Challenge (FTC) – Pioneer Robotics Club, Tucson, AZ — Aug 2022 — Present
Head Programming Mentor, Original Founding Member

- Taught sensor fusion, Kalman filtering, world-centric localization, multithreading, and path planning for automation.