

# Max Kim

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## Technical Skills

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**Programming:** C++, C, Python, MATLAB/Simulink, TypeScript

**Systems:** Linux, Embedded Systems, Real-Time Control, State Estimation, Sensor Fusion

**Tools:** Git, CMake, Docker, Bash, Microcontrollers

## Experience

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**Control Engineer,** Applied Control Engineering, Inc. – Baltimore, MD Jan 2025 – Present

- Develop and integrate control and automation software for industrial systems, emphasizing reliability, safety, and deterministic behavior
- Collaborate across mechanical, electrical, and software disciplines to translate system requirements into deployable control systems
- Led delivery of a \$134K+ industrial controls project after teammate departure, assuming sole responsibility for both PLC (control logic) and HMI (operator interface) development; successfully implemented, tested, and deployed a fully integrated system meeting all customer requirements

**Graduate Researcher,** University of Maryland – College Park, MD Apr 2022 – Dec 2024

- Designed and implemented control-oriented digital twin models for abdominal aortic aneurysm (AAA) assessment using MATLAB and Python, supporting simulation, estimation, and system validation
- Curated and processed a 600+ patient dataset, filtering to  $N < 80$  matched cohorts based on comorbidities, physical factors, and signal quality; validated model performance achieving 50%-68% sensitivity at 75% specificity (comparable to trained experts)
- First author on 1 peer-reviewed publication and co-author on 1 additional manuscript in progress, demonstrating end-to-end ownership of model development, validation, and quantitative analysis

## Projects

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**Custom UAV Flight Software** [github.com/khyeonn/pico-drone](https://github.com/khyeonn/pico-drone)

- Developing a fully custom UAV using off-the-shelf hardware and a custom flight control stack on RP2040 (Pi Pico 2)
- Implemented a multiplicative extended Kalman filter (MEKF) fusing 9-axis IMU data (accelerometer, gyroscope, magnetometer) for real-time attitude estimation
- Ongoing work focused on embedded real-time control, sensor fusion, and flight-critical software reliability

### Auto Repair Shop Queue Management System

- Built and deployed a production software system for local auto repair shop supporting 400+ jobs and \$75,000+ revenue in the first 2 months, managing 20+ customers daily
- Increased daily service throughput from 10 vehicles/day to 20+ vehicles/day by redesigning job intake, invoicing, and workflow visibility (owner-estimated)
- Executed daily live deployments while the shop remained operational using CI/CD with rollback capability; manually tested core workflows for hours on real and dummy jobs to prevent downtime, resolving a major outage overnight to ensure uninterrupted next-day operations

## Education

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University of Maryland, College Park – M.S. in Mechanical Engineering

Dec 2024

University of Maryland, College Park – B.S. in Mechanical Engineering

May 2023