Joseph Farkas

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Education

Georgia Institute of Technology — Atlanta, GA
Bachelor of Science in Computer Science, Devices and Intelligence (International Plan) — *May 2027*
Minors in Robotics and German — *GPA: 4.00*

- Relevant Coursework: Data Structures and Algorithms, Objects and Design

Experience

Guidance, Navigation and Control — Aug. 2025 – Present
Propulsive Landers @ Georgia Tech — *Atlanta, GA*

- Applying PID+LQR and nonlinear MPC to optimize rocket's fuel usage in real time powered descent
- Porting on-the-fly convexification algorithm from Python to Rust for on-device trajectory replanning

RoboCup: Autonomous Software Team — Aug. 2025 – Present
RoboJackets @ Georgia Tech — *Atlanta, GA*

- Developing multi-agent pathfinding, obstacle avoidance and task allocation in C++ for 6v6 robot soccer
- Building ROS stack to interface with telemetry, vision, and low-level control systems

UX Assistant — Aug. 2025 – Present
Georgia Tech PACE Supercomputing Center — *Atlanta, GA*

- Performing incident triage for researchers using high-performance Debian computing systems

Software Intern — Aug. 2024 – May 2025
Viasat Inc. — *Duluth, GA*

- Developed C/C++ firmware and Typescript frontend for prototype three-axis satellite antennas
- Improved responsiveness of ephemeris loading by 90% through multithreading and upgraded XML search
- Built algorithms for analyzing signal quality and atmospheric modeling
- Assembled and wired rig to test cable fatigue over 100,000 accelerated cycles

Software Department Lead — Oct. 2021 – May 2025
North Gwinnett Robotics — *Suwanee, GA*

- Trained 15 students with limited prior experience in utilizing C++ to process sensor input and control robots
- Designed and manufactured robot over eight weeks, coordinating to manage six-figure finances
- World Competition Divisional Champions & Autonomous Award, 3x State Champions

Projects

Natural ASL Communication | *Python, Docker, TensorFlow, Jupyter, OpenCV* — Sep. 2023 – Feb. 2024

- Applied action-based convolution neural networks on Google's Mediapipe holistic landmark model for OpenCV
- Interpreted 40 ASL phrases and 5 "moods" using facial language for natural English translation and emotive TTS
- Won second place at regional science fair

Autonomus Alignment using Holonomic Kinematics and CV | *C++, Java, Aruco* — Aug. 2023 – May 2025

- Applied second-order kinematics and jerk limiting to replicate S-curve profile for discretized holonomic drive
- Fused CV estimates from fiducials with filtered odometry using a state-space model for real-time robot location
- Developed a heuristic for scaling weight of vision data and latency compensation
- Allowed competition robot to align to any scoring position with $<$ 1cm accuracy regardless of starting state

Technical Skills

Computer Languages: Java, Python, C/C++, Rust, JavaScript, HTML/CSS, Dart
Frameworks & Libraries: ROS, React, Node.js, JUnit, Flutter, OpenCV, Aruco, Jupyter, pandas, Matplotlib
Developer Tools: Git/GitHub, Linux, Docker, Google Firebase, Android Studio, VS Code, Visual Studio, IntelliJ
CAD/CAM: Fusion 360, SolidWorks, Autodesk Inventor, 3D Printing, Laser Cutting, CNC Milling
Foreign Languages: German (Intermediate - B2), Hungarian (Native)