# Maya Kundakci

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## EDUCATION

**Carnegie Mellon University,** Pittsburgh, PA — May 2026
Bachelor of Science in Mechanical Engineering Minor in Robotics
**Relevant Coursework:** Principles of Imperative Computing, Mobile Robot Algorithms, Intelligent Robot Systems, Robot Kinematics and Dynamics, Feedback Control Systems

## TECHNICAL SKILLS

**Programming Languages:** Python, C, C++, JavaScript
**Operating Systems:** Unix, Linux, Windows
**Software and Tools:** MATLAB, ROS, OpenCV, PyTorch
**Additional Skills:** SolidWorks, Rhino, AutoCAD, ANSYS, Git

## WORK EXPERIENCE

**Hitachi Rail,** Reliability & Safety Intern — May 2025 – August 2025
- Developed a full-stack application integrating a React frontend with a Python backend and a SQL database to centralize reliability and safety-critical data, enhancing data accessibility and decision-making processes
- Performed Failure Mode and Effects Analysis to validate system redundancy and maintainability
- Applied Fault Tree Analysis (FTA), Markov models, and fault injection testing to simulate system-level failures, validate safety mechanisms, and assess reliability under stress conditions, leading to enhanced system robustness

**Carnegie Mellon University Resilient Intelligent Systems Lab** — October 2024 - Present
- Implemented MonoNav navigation stack on Crazyflie UAV, integrating ZoeDepth to convert RGB images to depth maps, and Open3D for obstacle detection
- Coded motion primitive algorithms for trajectory planning, validated through simulation and flight tests

## PROJECT EXPERIENCE

**TurtleBot Autonomous Navigation** (Python / C++) — August 2025 - Present
- Developed ROS 2 nodes for publisher/subscriber messaging, IMU–odometry complementary filters,
- Implemented occupancy-grid mapping and probabilistic sensor models; optimized noise/likelihood parameters to improve map consistency in cluttered environments

**Robotic Gripper with Crazyflie Integration** — July 2025
- Designed and 3D printed robotic gripper actuated by a DC motor + worm gear transmission
- Integrated with Crazyflie UAV for aerial pick-and-place operations; coded custom keyboard control interface

**State Estimation and Mapping** (Python) — March – April 2025
- Designed Kalman Filter and Extended Kalman Filter pipelines for state estimation using simulated sensor data
- Built a custom final project focused on occupancy grid mapping and localization using noisy sensor inputs, integrating real-time visualization and error analysis tools

**Benchtop Vice Modification** — September - November 2024
- Developed CAD models in SolidWorks for the motor-integrated vise, reducing user exertion and supporting grip strength for users with limited hand mobility
- Engineered a **power transmission** mechanism that converts the motor's rotational motion to linear movement, enhancing accessibility

**Autonomous Robotics Systems** (Python) — September - November 2024
- Implemented PID and trajectory tracking controllers for quadrotor flight in simulation, achieving stable autonomous control using time-parameterized polynomial inputs
- Developed motion planning algorithms including grid-based A* and quintic trajectory smoothing, ensuring collision-free and dynamically feasible navigation in 2D and 3D environments

## LEADERSHIP EXPERIENCE

**Vice President of Social Standards, VP of Recruitment, Delta Gamma Sorority, Pittsburgh PA** — December 2023 - Present
- Led directors and committees in upholding policies and accountability, and driving positive chapter programming
- Led a large-scale recruitment process for a pool of 170+ Potential New Members, maintaining strong communication

**Booth Head Chair, Pittsburgh PA** — May 2023 - Present
*Booth is part of the Carnegie Mellon annual spring carnival. Students design and build carnival booths 20'x15'x18' in dimension.*
- Designed the 1st place winning two-story booth for the 2024 spring carnival using Rhino software
- Orchestrated diverse teams (structural, electrical, craft) totaling 85+ individuals in the planning and execution of the Booth