Ankit Khandelwal

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EDUCATION

CARNEGIE MELLON UNIVERSITY
B.S. Electrical/Computer Engineering
Expected Graduation: Dec 2024
GPA: 3.61/4.0

Relevant Coursework
- Computer Vision
- Machine Learning
- Embedded Software
- Computer Architecture
- Functional Programming
- Data Structures + Algs
- Linear Algebra
- Probability/Multivar Calc
- Design of Digital Systems
- Signals & Systems

THOMAS JEFFERSON HS FOR SCI/TECH
GPA: 4.47/4.0
SAT: 1600

HS Courses
Artificial Intelligence I & II
Multivariable Calculus
Advanced Math Techniques
AP Computer Science
Robotics I & II
Analog/Digital Electronics
Quantum Mechanics

SKILLS

PROGRAMMING
C/C++ - (3 Years)
Python - (5 Years)
Java - (4 Years)
MatLab/SimuLink - (2 Years)
Git, GitHub - (3 Years)
ROS1/ROS2 - (2 Year)
Bazel • CMake • Colcon
Linux (Ubuntu, Debian) • Docker
TensorFlow • Keras • PyTorch
NumPy • SciPy • OpenCV
ArduPilot • BetaFlight

ROBOTICS
Arduino/Teensy - (5 Years)
Raspberry Pi - (4 Years)
Jetson TX2, AGX Xavier - (2 Years)
Fusion360 (CAD) - (2 Years)
Eagle, KiCAD (PCB Design) - (1 Year)
Embedded SW • I2C • Serial

EXPERIENCE

RIVIAN | May 2023 - Aug 2023
Self-Driving Intern
- Developed C++ camera provisioning and auth utility, cutting costs by $200k/yr
- Architected custom encryption + I2C comm functions to interface w/ cameras
- Developed 3D-reconstruction utility via NeRFs for perception testing for hackathon

CARNEGIE MELLON RACING - DRIVERLESS | Sep 2021 - Present
VP of Driverless - Project Lead (Jun 2023 - Present)
- Leading team of 30 to develop autonomous racecar capable of racing at 40kph
- Pioneering driverless FSAE through collaboration w/ other universities and sponsors
- Developing late-fusion approach for camera and LiDAR estimates using EKF-SLAM
- Experimenting w/ novel factor-graph approach to correct landmark poses up to 4m
- Leading teamwide transition to C++/ROS2, improving full-stack runtime by 50Hz

Perception Captain (Sep 2021 - Jun 2023)
- Trained YOLOv5 model that achieved 92% accuracy on cone detections through augmented dataset (gaussian blur, color distortion) & hyperparameter optimization
- Utilized multithreading to reduce data collection time by 94% (50ms -> 3ms)
- Optimized DBSCAN, ground-filtering algorithm for LiDAR point cloud clustering

CMU NAVLAB - PROFESSOR JOHN DOLAN | May 2023 - Sep 2023
Perception Research Assistant
- Designed EKF-SLAM algorithm for accurate pose estimation and landmark tracking
- Achieved pose estimates within 8% of ground-truth given noisy measurements
- Experimented w/ data-association strategies (MLE w/ mahalanobis dist., JCBB)
- Translated initial Python implementation to C++, improving runtime by 90%

SPACEX | May 2022 - Aug 2022
Starship Software Intern
- Architected Python codebase to automate testing of self-destruct PCB, including 12+ testcases. Automated platform increased daily testing output by 1000%
- Optimized data collection scripts to enable sampling and processing at 100KHz
- Designed visualization tool to scrape 75+ test reports and graph 1000+ datapoints

TJ NANOSATELLITE TEAM | Oct 2017 - Jun 2021
Avionics Lead
- Led team of 4 to devise avionics onboard NASA-sponsored satellite, including power/control systems for UHF radios, GPS. Deployed from ISS in Nov, 2022
- Designed & developed custom PCB to host FC, GPS, EEPROM through 4+ iterations
- Optimized power draw of onboard devices by 25% via power budget management

PERSONAL PROJECTS

VERTICAL TAKEOFF & LANDING ROCKET | Aug 2020 – Sep 2021
- Developed propeller-powered rocket to reach apogee of 3m and autonomously land
- Designed and tested Kalman Filter in C++ for accurate state and pose estimation
- Modeled vehicle dynamics and auto-tuning PID control in MATLAB & SimuLink

DIY QUADCOPTER | Nov 2018 – Dec 2019
- Configured flight hardware using BetaFlight, an open-source drone firmware
- Logged 50+ flight hours on drone simulator, 25+ hours drone pilot hours