

Ankit Khandelwal

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EDUCATION

CARNEGIE MELLON UNIVERSITY, B.S. + M.S.

Electrical/Computer Engr.

Graduation: May 2025

GPA: 3.54/4.0

THOMAS JEFFERSON HS FOR SCI/TECH

GPA: 4.47/4.0

SAT: 1600

COURSEWORK

COLLEGE

- Deep Learning (CS 11785)
- Computer Vision (ROBO 16785)
- Machine Learning (CS 10301)
- Intro. Control Theory (ECE 18340)
- Parallel Comp. Prog. (CS 15418)
- Embedded Software (ECE 18349)
- Digital Systems (ECE 18240)
- Signals & Systems (ECE 18290)
- Functional Prog. (CS 15210)
- Data Struct. + Algs (CS 15122)
- Linear Algebra (MATH 21254)
- Prob Theory (MATH 36219)
- Discrete Math (MATH 21127)

HIGH SCHOOL

AI • Robotics • Analog/Digital Electronics • Multivar Calc
Quantum Physics • AP CS

SKILLS

PROGRAMMING

C/C++ - (3 Years)

Python - (5 Years)

Java - (4 Years)

MatLab/SimuLink - (2 Years)

Git, GitHub - (3 Years)

ROS1/ROS2 - (2 Year)

cuDNN • ONYX • Scikit- Learn

Linux (Ubuntu, Debian) • Docker

TensorFlow • Keras • PyTorch

NumPy • SciPy • OpenCV

Eigen • Point Cloud Library

ArduPilot • BetaFlight

Bazel • CMake • Colcon

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

VIAM ROBOTICS | MAY 2024 - AUGUST 2024

MOTION PLANNING INTERN

- Developed custom, time-optimal trajectory planner for 6-DOF robotic arm, capable of respecting joint velocity, acceleration constraints to produce smooth motion
- Solved unconstrained parabolic blends problem through novel linear algebra solution
- Implemented importance sampling to improve RRT smoothing runtime by 65%

CARNEGIE MELLON RACING - DRIVERLESS | SEP 2021 - JUN 2024

VP OF DRIVERLESS - PROJECT LEAD (JUN 2023 - JUN 2024)

- Led team of 30 students to develop autonomous racecar capable of racing at 40mph
- Pioneered inaugural Formula Student Driverless competition in North America
- Optimized LiDAR filtering, clustering, coloring algorithms for 120k points at 15Hz
- Developed novel path planner through use of nonlinear support vector machine
- Led teamwide transition to C++/ROS2, improving full-stack runtime by 250%

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
- Developed time sync scheme for sub-25ms alignment of GPS, LiDAR, Camera data

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%

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

SPACEX | MAY 2022 - AUG 2022

STARSHIP SOFTWARE INTERN

- Architected automated testing of PCBs, increasing 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

PERSONAL PROJECTS

RL DRONE CONTROLLER | JUNE 2024 - PRESENT

- Implementing Proximal Policy Optimization (PPO) for responsive drone control
- Using clipped surrogate objectives to balance exploration vs exploitation
- Created custom simulator to train feed-forward network and visualize drone physics

VERTICAL TAKEOFF & LANDING ROCKET | AUG 2020 - SEP 2021

- Developed propeller-powered rocket to reach apogee of 3m and autonomously land
- 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