



Anirudh Addagada

anirudh.a99@icloud.com github.com/kck1337 +1-718-473-4102 [linkedin.com/in/anirudh-addagada](https://www.linkedin.com/in/anirudh-addagada)

EXPERIENCE

NYU Mechatronics, Controls, and Robotics Lab

New York, USA

Research Assistant

Sept 2022 to Current

- Developed an indoor localization system using WiFi RTT ranging technology while simultaneously mapping WiFi devices in 3D space with errors under 1 meter.
- Performed sensor fusion for indoor localization using Python, C++, ESP32S2, and BNO055 IMU to achieve accuracy of $\pm 60\text{cm}$, using Extended Kalman Filtering to improve the accuracy of the IMU and WiFi ranging systems.

NYU Tandon School of Engineering

New York, USA

Course Instructor

Sept 2022 to May 2023

- Instructed students in Automatic Controls and Measurement Systems on topics such as filters, PID/LQR controllers.
- Conducted hands-on experiments using oscilloscopes and opamps, and building controllers with HIL systems interfaced with MATLAB, using DACB, from sensor calibration to fully operational controllers.

EDUCATION

New York University

New York, USA

Master of Science in Mechatronics and Robotics|Specialization in Mobile Robotics

Sept 2021 to May 2023

Courses: Robot Localization and Navigation, Robot Perception, Reinforcement Learning and Optimal Control, Advanced Mechatronics

PES University

Bangalore, India

Bachelor of Technology in Mechanical Engineering|Specialization in Automotive Engineering

Aug 2017 to May 2021

Courses: Vehicle Dynamics, Mechanical Vibrations, Automotive Systems, Control Engineering

PROJECTS

Iterative Closest Point registration

Robot Perception

Implemented point-to-point Iterative Closest Point algorithm using Open3D API to align point clouds.

- Benchmarked performance on dense and sparse point cloud data using the KITTI dataset.

Visual place recognition

Distributed Computing, Image Processing, Bag of visual words

Developed VPR system using distributed computing on NYU HPC cluster with 160% improvement in runtime.

- The system analyzes a dataset of images captured across the city to identify the location of a given query image, employing feature detection and Bag of Visual Words for efficient processing and quick query response.

One Shot Full Body Texture Completion

Deep Learning, UV Textures, Computer Vision

Trained a deep learning model with accuracy of 94% using TensorFlow and Keras to generate full-body texture in UV space from a single frontal image as input, enabling subject randomization during training to mitigate training bias.

- Achieved full-body textures in various conditions with applications in virtual and augmented reality, gaming, and animation.

Iterative LQR on quadrotor for trajectory tracking and aerobatic movements

Optimal Control

Implemented Iterative Linear Quadratic Regulator (LQR) with finite and infinite horizons for trajectory planning of aerobatic movements on a simulated 2D quadrotor.

- Created and applied quadratic cost function to reduce state space errors and improve controller efficiency.

Recursive state estimation of a Quadrotor using Kalman Filter

Robot localization

Implemented EKF and UKF using IMU and camera data from a quadrotor to estimate its pose and velocity.

- Used optical flow on camera data to estimate linear and angular velocity using RANSAC algorithm for a quadrotor's 3D pose estimation.

Q-Learning on motor actuated inverted pendulum

Reinforcement Learning

Implemented Q-learning algorithm using Python to learn an optimal control policy.

- Incorporated a value function to guide the Q-learning algorithm toward finding a policy that optimizes the tradeoff between stability and energy consumption, used epsilon-greedy policy to efficiently explore the state-action space.

SKILLS SUMMARY

- Languages:** Python, C++, C, MATLAB, Bash
- Frameworks:** Scikit, TensorFlow, Keras, ESPIDF
- Tools:** SolidWorks, GIT, Eagle CAD, Fusion 360, Network protocols
- Platforms:** Linux, Windows, Arduino, Single Board Computers, ROS/2
- Other:** 3D Printing, Rapid Prototyping, Simulation, Digital control systems