

EDUCATION

- **University of California San Diego** San Diego, CA
• **Master of Science in Electrical and Computer Engineering — Robotics** Sep. 2022 – June 2024
Relevant Courses: Sensing and estimation for robotics, Planning and learning in robotics, Digital Image Processing, Statistical Learning (Bayesian probability), Visual Learning (Computer Vision)
- **Indian Institute of Technology** Tirupati, India
• **Bachelor of Technology in Electrical Engineering** Aug. 2015 – Aug. 2019

TECHNICAL SKILLS

- **Programming Languages/ Framework:** Python, C++, PyTorch, TensorFlow, Keras, OpenCV, TinyML
- **Software:** MATLAB(signal and image processing toolbox), IAR embedded workbench, Minitab
- **Computing Environments:** Linux, Windows, Nvidia Jetson, STM32/ TI micro-controller, ESP32 MCU

EXPERIENCE

- **UC San Diego** San Diego, CA
• **Summer Research Internship** July 2023 - Sep. 2023
 - Created a self-supervised learning pipeline utilizing SuperPoint keypoint descriptor extraction from privacy-preserving lens images for Visual Inertial Simultaneous Localization and Mapping (SLAM)
 - Design a Neural Network pipeline to extract feature descriptors out of Event Camera to perform SLAM
- **Graduate Student Researcher** Jan 2023 - June 2023
 - Developed slippage correction algorithm for eyeglass-mounted cameras to accurately calibrate gaze estimation, reducing gaze mapping of real-world error from 40% to 20%
- **Honeywell** Bangalore, India
• **Embedded Engineer** July 2019 - July 2022
 - Introduced fire detection algorithm (into existing 3IR flame detector) compliant with EN54 (European certification), saving 10 months of development cycle and 10+ human resources for data collection
 - Developed Machine Learning (ML) framework utilizing Python scientific libraries, compatible with existing dataset, for Triple IR sensor-based flame detection, saving 150 man-hours of data collection cycle
 - Trained and deployed state-of-the-art object detection model (YOLOv4) in NVIDIA Jetson Nano for autonomous maritime search-and-rescue purposes to gather project funding from the global team
 - Prototyped a novel visible plus thermal camera-based flame detection for annual innovation challenge (CV, deep learning and TinyML framework), contributing towards high value Intellectual Property
 - Mentored 3 interns with technical tasks in ML/Computer Vision (CV), and professional efficiency
- **Achievements** July 2019 - July 2022
 - 8 IP awards: Filed 6 Trade Secrets and 2 U.S. patent applications (currently under review)
 - Diamond award: Awarded 2nd position out of 276 ideas presented at annual innovation competition
 - Certification: Six Sigma Green Belt DFSS Hardware and AI/ML Bootcamp

RESEARCH — ACADEMIC PROJECTS

Sep. 2022 - Present

- **Particle Filter SLAM:** Modeled Particle Filter for indoor localization and mapping of differential-drive robot using LiDAR to generate probabilistic occupancy grid of unknown environment
- **Visual Inertial SLAM:** Implemented VI SLAM by designing Extended Kalman Filter for localization and landmark mapping to track 3D pose of robot using sensor fusion of gyroscope, accelerometer, and camera measurements
- **Autonomous Navigation:** Implemented dynamic programming algorithm for deterministic shortest path problem to minimize the value function, optimize control actions to find the shortest path from door to key avoiding the obstacles
- **Trajectory Tracking:** Optimized non-linear problem using python CasADi solver to get optimal control policy for accurate trajectory tracking. Compared Receding-Horizon Certainty Equivalent Control and Generalized Policy Iteration
- **Motion Planning:** Compared search based (A*) and sampling based (RRT) algorithms in a continuous 3D environment