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**EDUCATION**

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- **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/ Deep Learning)*
- **Indian Institute of Technology** Tirupati, India  
• **Bachelor of Technology in Electrical Engineering** Aug. 2015 – Aug. 2019

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**TECHNICAL SKILLS**

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- **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

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**EXPERIENCE**

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- **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 keypoints out of Event Camera to perform efficient SLAM
- **Graduate Student Researcher** Jan 2023 - June 2023
  - Analysed visual attention in the context of machine learning and human vision by estimating gaze points
  - Implemented slippage correction algorithm for eyeglass-mounted cameras to accurately calibrate gaze estimation algorithm, reducing gaze mapping error of real-world frame 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
  - 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
- **Key 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: Certified for Six Sigma Green Belt DFSS Hardware and AI/ML Bootcamp Program

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**RESEARCH — ACADEMIC PROJECTS**

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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:** Executed dynamic programming algorithm for deterministic shortest path problem to minimize value function, optimize control actions to find shortest path from door to key by avoiding 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:** Executed and engineered a compelling comparison between search-based (A\*) and sampling-based (RRT) algorithms, unveiling their distinct performances in a dynamic continuous 3D environment
- **Image Segmentation:** Trained a PyTorch-based UNet with attention module and compared it to Deeplabv3 with Resnet 101 backbone for road object detection, achieved pixel-level accuracy of 91% with UNet