

# SUDHANSH PEDDABOMMA

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## EDUCATION

- University of California San Diego** Sep 2023 - Mar 2025  
Master of Science in Computer Science and Engineering, Specialization in Artificial Intelligence **GPA 4.00/4.00**  
▪ Key Courses - Computer Vision, Robotics, Machine Learning Systems, Software Engineering, Recommender Systems
- Indian Institute of Technology Bombay** Jul 2019 - Jul 2023  
Bachelor of Technology with **Honors** in Computer Science and Engineering, Minor in **Entrepreneurship** **CPI 9.66/10**  
▪ Key Courses - Advanced Image Processing, Machine Learning, Linear Algebra, Probabilistic Theory, Web Security

## EXPERIENCE

- Computer Vision Intern | Duality AI** Jun 2024 - Sep 2024  
▪ Built scalable pipelines integrating COLMAP, Reality Capture, nerfstudio and Unreal Engine to generate high-fidelity **Gaussian Splatting** digital twins in synthetic environments, reducing digital-twin generation time **by 40%**  
▪ Developed a 3D reconstruction workflow using point-cloud registration to improve robustness for *feature-less objects*  
▪ Collaborated with **Autodesk** to validate **Unreal Engine** simulations for robotics tasks; leveraging structured domain randomization to reduce Sim2Real gap and increase **mAP-50 by 15%** for object detection and segmentation
- Data and Applied Scientist Intern | Microsoft India** May 2022 - Jul 2022  
▪ Developed a **decision-tree ranker** to recommend emails without user queries, improving **Outlook search** capabilities  
▪ Integrated data pipelines across team infrastructures, combining user-specific features from large-scale context logs  
▪ Proposed **hierarchical feature-sets** for the ranker, reducing latency for recommendations and improving recall

## KEY PROJECTS

- Inverse Rendering with 2D Gaussian Splatting | [REPORT]** Mar 2024 - May 2024  
▪ Developed a novel inverse rendering framework in **CUDA** to recover PBR properties of a scene using **2D Gaussian Splatting**  
▪ Improved normal map **MAE by 15%** over the current SOTA methods, achieving superior novel-view synthesis and relighting
- Real-time 3D Perception for Home Robots** Sep 2023 - Sep 2024  
Graduate Student Researcher, Supervisor: Prof. Henrik Christensen UC San Diego  
▪ Investigated real-time **dense visual SLAM** methods using **NeRFs** and **Gaussian Splatting** for robot navigation  
▪ Integrated object segmentation, grasp-pose estimation, and 3D mapping on the Fetch robot via **ROS**, demonstrating a novel tabletop object rearrangement algorithm that reduced cost by **20%** compared to the state-of-the-art approach
- 3D Tomography with Primal-Dual Neural Networks** May 2021 - Jul 2023  
UCL Research Internship, Supervisor: Prof. Marta Betcke University College London  
▪ Developed a stochastic deep-learning architecture of primal-dual algorithm for **online reconstruction of 3D volumes** from tomographic projections and obtained **99.6 % structural similarity** in challenging low-dosage conditions  
▪ Built a Python library with custom gradient operators for reconstructing volumes in a **single pass**, reducing compute requirements by **up to 5x** over SOTA learning-based approaches for cone vector tomography
- Image Reconstruction in Saturated Compressed Sensing | [REPORT]** Jul 2022 - Jun 2023  
Bachelor's Thesis, Supervisor: Prof. Ajit Rajwade IIT Bombay  
▪ Proposed a novel likelihood maximization technique to recover **signals, images, and audio** from compressed measurements, achieving **20% lower RMSE** over the state of the art methods even with high saturation effects  
▪ Designed a debiased LASSO-based algorithm for correcting misclassified measurements in group testing of Covid-19, rectifying upto **15% mislabeled measurements** with Gaussian noise
- **Image Colorization GAN.** Deployed a web-app to color grayscale images using pix2pix **U-Net architecture** GAN  
▪ **Autonomous Robot.** Developed a Roomba-like robot with **visual-SLAM** using EKF and A\* path planning on ROS  
▪ **Sudoku Solver.** Created an **Augmented Reality** app to solve Sudoku from live feed, with robust **real-time performance**

## SKILLS

- Programming** C++, C, Python, MATLAB, Linux and Bash, SQL, HTML, Javascript  
**Tools & Software** PyTorch, ROS, TensorFlow, scikit-learn, OpenCV, ReactJS, Matplotlib, Arduino  
**Expertise in** Full-stack development, Generative AI, 3D Perception, ML Systems, Statistical Image Processing