

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 pipelines to generate high-fidelity **Gaussian Splatting** synthetic environments to validate vision models in real-world
- Designed automated 3D reconstruction techniques for featureless objects, reducing digital-twin generation time **by 40%**
- 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

Mirror AI: Deployable Personas | Honorable mention in Supabase YC Hackathon

Oct 2024 - Dec 2024

- Designed an **agentic LLM architecture** with **LangGraph** to mirror user personalities, creating interactive digital personas
- Deployed a **full-stack platform** using **Supabase** backend and **Vercel** frontend for secure hosting and user authentication
- Integrated with **Notion API** to add personal context and enabled users to publish their personas with one-click deployment

Improving LLM Reasoning for Numerical Problems | [REPORT]

Sep 2024 - Dec 2024

- Enhanced **MathPrompter** (ACL 2023) with CoT, achieving **10% higher accuracy** on **Llama 3.1 1B** where prior methods failed
- Reduced hallucination rates significantly by integrating multi-step validation, ensuring robust and consistent outputs

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 neural-network 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 Colorization GAN**. Deployed a web-app to color grayscale images using pix2pix **U-Net architecture** GAN
- **Sudoku Solver**. Created an **Augmented Reality** app to solve Sudoku from live feed, with robust real-time performance
- **Autonomous Robot**. Developed a Roomba-like robot with **visual-SLAM** using EKF and A* path planning on ROS

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