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 - ML Systems, Computer Vision, Robotics, Recommender Systems, Statistical Natural Language Processing

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, Reinforcement Learning, Machine Learning, Linear Algebra, Probabilistic Theory

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
- Built a **full-stack platform** using **Supabase** and **Vercel** for secure hosting, user authentication, and data management

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

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, achieving **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

Other Projects
- **Image Colorization GAN**. Deployed a web-app to color grayscale images using pix2pix **U-Net architecture** GAN
- **Perception for Home Robot.** Investigated visual SLAM methods with **NERFs** and **Gaussian Splatting** for robot navigation
- **Sudoku Solver**. Created an **Augmented Reality** app to solve Sudoku from live feed, with robust real-time performance

PUBLICATIONS

1. J. Hu, J. Szczekulski, **S. Peddabomma**, H. Christensen, **Scalable Planning for optimal Tabletop Object Rearrangement** *Published at International Conference on Robotics and Automation (ICRA) 2025*
2. S. Banerjee, **S. Peddabomma**, R. Srivastava, J. Saunderson, A. Rajwade, **Identification and Correction of Permutation Errors in Compressed Sensing Based Group Testing** *Published at IEEE Acoustics, Speech, and Signal Processing 2025*
3. **S. Peddabomma**, S. Banerjee, R. Srivastava, A. Rajwade, **A likelihood based method for compressive signal recovery under Gaussian and saturation noise** in Elsevier Signal Processing 2024 DOI: 10.1016/j.sigpro.2023.109349

SKILLS

Programming	C++, C, Python, MATLAB, Bash, SQL, HTML, Javascript
Tools & Software	PyTorch, ROS, TensorFlow, scikit-learn, OpenCV, Angular, Matplotlib, Arduino
Expertise in	3D Reconstruction - Gaussian Splatting, Generative AI, Statistical Image Processing, Camera Models