

JAY SAWANT

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EDUCATION

University of California, San Diego

Master of Science in Data Science at HDSI — GPA: 3.97/4.0

Sept 2024 – March 2026

San Diego, USA

Indian Institute of Technology Bombay

Bachelor and Master of Technology in Electrical Engineering — Major GPA: 8.9/10

July 2018 – June 2023

Mumbai, India

PUBLICATIONS

J. Sawant, E. Kaestner, E. Gleichgerrcht, L. Bonilha, C. R. McDonald, K. Hasenstab. “NeuroLDM-3D: Enhancing Neurological Disease Detection by Leveraging Conditional Latent Diffusion for Brain MRI Synthesis.” *Computers in Biology and Medicine*, submitted, 2025. [\[Preprint\]](#)

A. Patil, H. Diwakar, **J. Sawant**, N. C. Kurian, S. Yadav, S. Rane, T. Bameta, A. Sethi. “Efficient quality control of whole slide pathology images with human-in-the-loop training.” *Journal of Pathology Informatics*, 14:100306, 2023. [\[Publication\]](#)

A. Patil, G. Jain, H. Diwakar, **J. Sawant**, T. Bameta, S. Rane, A. Sethi. “Semantic segmentation based quality control of histopathology whole slide images.” *arXiv preprint arXiv:2410.03289*, 2024. [\[Preprint\]](#)

TECHNICAL SKILLS

Programming: Python (PyTorch, NumPy, Scikit, TensorFlow, Pandas, OpenCV), C++, MATLAB, Bash

Tools & Frameworks: AWS, Slurm, PyTorch-DDP, Linux, Git, Docker, Cursor, Vertex AI, Huggingface

Courses: Deep Generative Models, Reinforcement Learning, Machine Learning, Web Mining and Recommender Systems, Statistical Models, NLP, Automatic Speech Recognition, Probability and Statistics, Linear Algebra, Medical Image Computing

RESEARCH EXPERIENCE

Autonomous Driving Research (Imitation Learning) @ Netradyne

June 2025 – September 2025

San Diego, USA

Research Engineer Intern

- Benchmarked SimLingo (camera-only, ~1B) vs. TransFuser++ (camera+LiDAR, ~120M) and replicated closed-loop results on CARLA Leaderboard & Bench2Drive showing similar performance with far fewer parameters
- Trained a camera-only TransFuser++ (~30M) on SimLingo’s ~5× larger dataset, achieving near-parity with SimLingo and demonstrating that scaling data—even with simpler models—can match the SOTA performance of complex models
- Added causal temporal attention (4 frames, 250 ms stride) to capture actor dynamics; driving score was unchanged vs. a 1-frame baseline, indicating 1 frame + ego speed suffices without 4-frame temporal context

Synthetic 3D MRI Generation @ Cognitive Imaging Lab, UCSD

Jan 2025 – Present

San Diego, USA

Graduate Student Researcher [\[Preprint\]](#) [\[Github\]](#)

- Developed a conditional latent diffusion pipeline by integrating a VAE for latent space compression with a 3D diffusion transformer (DiT-3D), enabling the generation of high-fidelity, class-specific synthetic 3D brain MRIs with FID of 16.9
- Augmented the real brain MRI dataset with synthetic data, leading to substantial improvements in F1-score, accuracy, AUC-ROC, and AUCPR for a temporal-lobe epilepsy classifier trained using an EfficientNet-V2 backbone
- Future Objective: Pre-train a 3D ViT on integrated real and synthetic datasets and utilize it for vision-language tasks

Deep learning in Histopathology @ MeDAL, IIT Bombay

May 2022 – June 2023

Mumbai, India

M.Tech Thesis under Prof. Amit Sethi [\[Publication\]](#) [\[M.Tech Thesis\]](#)

- Employed an active learning method to train a classifier, achieving efficient segmentation of WSIs into six tissue regions and outperforming the popular image-processing-based HistoQC tool with higher dice scores on 70% of the WSIs
- Secured 16th place (F1 score 0.67) in the 2023 OCELOT Challenge using DeepLabV3 for cell detection and classification

Cardiac Arrhythmia Detection @ Probeplus Solutions

May 2024 – July 2024

Bangalore, India

AI Consultant

- Trained a baseline CNN and a multi-head attention-based model as a part of a remote-health monitoring system to achieve a multi-label classification of 26 arrhythmias using a dataset of 12-lead ECG recordings from PhysioNet 2021 challenge
- Improved the model performance by integrating an RNN branch for temporal context and by calculating cross-attention features between CNN and RNN outputs, achieving 2% increase in the challenge score on external test dataset

Contrastive learning in Chest X-rays @ Qure.ai

May 2022 – August 2022

Mumbai, India

AI Scientist Intern

- Achieved 0.80 AUC on a 280K-image chest X-ray test set by training ResNet50 on 1.2M scans for opacity classification and boosting the performance with a Supervised Contrastive Learning-pretrained backbone

WORK EXPERIENCE

Software Development Engineer @ Enphase Energy

Design Verification Testing Team – Home Energy Management System

July 2023 – May 2024

Bangalore, India

- Collaborated with a 7-member Test Automation team to develop and maintain a Python-based test framework
- Utilized Object-Oriented Programming techniques to create comprehensive test suites for the hardware test automation
- Developed a Python library leveraging the Jama REST API to connect to Jama, fetch test cases, execute them on a local PC, and update results in Jama, providing end-to-end automation support for the Design-Verification-Test team

PROJECTS

Erasing Invisible Image Watermarks | DSC261: Responsible Data Science, UCSD [\[Github\]](#) September 2025 – December 2025

- Achieved 95.7% watermark removal with improved perceptual quality (PSNR 28.1 dB, SSIM 0.82, LPIPS 0.078) by implementing a combined adaptive VAE-based and diffusion-based pipeline.
- Improved image quality by +6 dB PSNR and +0.18 SSIM by integrating color-contrast transfer in CIELAB space on top of fine-tuning a VAE-based reconstruction model

LLM Robustness on Adversarial Attacks | DSC291: Safety in AI, UCSD

September 2025 – December 2025

- Conducted a comparative study of post-training defenses using Tinker API from Thinking Machines Lab against prompt injection on small chat-tuned LLM (Llama 3.2 – 1B), implementing LoRA-based supervised fine-tuning, DPO-style preference optimization, and external LLM guard pipelines
- Curated synthetic jailbreak and benign interaction datasets to evaluate robustness, demonstrating that alignment-style fine-tuning reduces attack success while preserving model helpfulness relative to prompt-engineering baselines

Person to Person Virtual Try-On | ECE285: Deep Generative Models, UCSD [\[Report\]](#)

April 2025 – June 2025

- Generated a paired-person dataset from VITON-HD images using IDM-VITON preprocessing and DensePose
- Engineered a 16-block diffusion-transformer denoiser with self and cross-attention for garment conditioning and FiLM-timestep modulation, optimized via noise-aware EDM, custom 2nd order ODE solver, and CFG to achieve FID 27.7

RAG-based Multimodal Medical QnA App | MED277: Biomedical NLP, UCSD [\[Report\]](#)

Oct 2024 - Nov 2024

- Designed a RAG-based multimodal medical chatbot app with multilingual capabilities, integrating a Google Translate API, BiomedBERT embeddings for context retrieval, Gemini 1.5 Pro for output generation, and Gradio for a web interface

Identity Aware Portrait Generation | CS726: Advanced Machine Learning, IITB [\[Report\]](#)

Feb 2022 - April 2022

- Adapted CycleGAN for face-to-portrait translation using a FaceNet-based perceptual loss to preserve facial features