Saumya Gupta

saumgupta@cs.stonybrook.edu |+1 631-946-1362 | Website: https://saumya-gupta-26.github.io/ | LinkedIn | Google-Scholar | Github

EDUCATION

Stony Brook University (SUNY Stony Brook) — Stony Brook, NY
PhD in Computer Science, GPA: 4.00/4.00 — 08/2021 – 03/2026

National Institute of Technology Karnataka (NITK) Surathkal — Mangalore, India
BTech in Computer Science and Engineering, GPA: 9.49/10.00 — 08/2014 – 05/2018

WORK EXPERIENCE

Adobe Inc. — San Jose, CA
Research Scientist / Engineer Intern — 05/2025 – 08/2025

- Trained a AI Agents RL framework using GRPO with hierarchical planning agents and data-driven reward models to improve LLM reasoning for automated short-form social-media video creation from user assets |Python, PyTorch, Huggingface, TRL, Unsloth
- Achieved 63.7% user preference over GPT-4o in video engagement and Pearson correlation >0.7 with human evaluators

Adobe Inc. — San Jose, CA
Research Scientist / Engineer Intern — 05/2024 – 11/2024

- Spearheaded curation of VidES, the first dataset linking short-video engagement to editing operations (231 videos, 1042 human responses)
- Led research efforts on Multimodal LLMs (MLLMs) for social-media video engagement prediction and targeted refinement suggestions
- Decomposed engagement prediction into video editing elements (transitions, narration, etc), thereby improving interpretability and outperformed GPT4o by 41.6% on engagement prediction and 24.1% on video editing suggestion quality **(ICME'25)** | Python, PyTorch

Stony Brook University — Stony Brook, NY
Graduate Research Assistant — 08/2021 – 03/2026

- Proposed a topology-aware GenAI diffusion model that enforces exact object counts in AI-generated images, achieving 58.8% higher count accuracy over CLIP-based methods for generating images from prompts in COCO dataset **(ICLR'25)** | Python, PyTorch | [code]
- Enhanced image segmentation by proposing structure-wise uncertainty using topology and graph neural networks (GNNs) **(NeurIPS'23)**. Integrated with 3D Slicer, achieving 81.2% better human satisfaction for annotation in NASA TLX evaluation | PyTorch, C++ | [code]
- Designed an efficient convolution-based boundary-aware objective function for multi-class image segmentation, reducing topological errors (anatomical violations) across 2D/3D and multiple medical imaging modalities (CT, US) **(ECCV'22 Oral)** | Python, PyTorch | [code]

Samsung Research & Development Institute — Bangalore, India
Senior Software Engineer — 06/2018 – 06/2021

- Developed a lightweight deep learning model (CNN) to replace the ISP pipeline, improving denoising across scenes/ISO levels. Optimized for mobile via knowledge distillation, pruning, and quantization (commercialized in Samsung Galaxy S21) | Tensorflow, TensorFlow Lite
- Implemented a GAN model for super-resolution of 3D ultrasound ovarian volumes by up to 2x (SPIE'21 Oral) | Python, PyTorch
- Introduced security measures such as anonymization / deanonymization of PHI data in Samsung's healthcare DICOM platform. Redesigned and secured the image database with encryption to meet the HIPAA compliance requirement | C++, PostgreSQL, OpenSSL

Samsung Research & Development Institute — Bangalore, India
Software Engineer Intern — 05/2017 – 08/2017

- Designed a tile-based vertical scrolling approach in Vulkan, minimizing GPU load and reducing frame refresh latency by 36.9% | C, C++

SELECTED PUBLICATIONS

SmartEdit: Editing-driven Engagement Prediction and Enhancement of Short-Videos
Saumya Gupta, Ishita Dasgupta, Stefano Petrangeli, Somdeb Sarkhel — ICME 2025

TopoDiffusionNet: A Topology-aware Diffusion Model [link]
Saumya Gupta, Dimitris Samaras, Chao Chen — ICLR 2025

Topology-aware Uncertainty for Image Segmentation [link]
Saumya Gupta, Yikai Zhang, Xiaoling Hu, Prateek Prasanna, Chao Chen — NeurIPS 2023

Learning Topological Interactions for Multi-Class Medical Image Segmentation [link]
Saumya Gupta, et al. — ECCV 2022 (Oral)

PROFESSIONAL ACTIVITIES & SELECTED AWARDS

Peer Reviewer: ECCV, CVPR, ICLR, NeurIPS, ICML, AAAI, ISBI, DALI, TNNLS, TMI — 2023 – Present
Outstanding Reviewer Awards: ECCV, ICLR, CVPR — 2024 – Present
Conference Tutorial & Workshop Organizer: MICCAI — 2023, 2024
Course Instructor & Teaching Assistant: Bio-Informatics Bootcamp, and Theory of Computation — 2023, 2024, 2025
Samsung Spot Award, Samsung Quality Champions Annual Award, Samsung Professional Level Software Certification — 2018 – 2020

SKILLS

Languages, Tools, Frameworks: Python, C, C++, Java, PostgreSQL, PyTorch, Keras, TensorFlow, TFLite, Unsloth, TRL, OpenCV, MATLAB, Git, LaTeX, Huggingface, Adobe After Effects, Photoshop, Sony Vegas Pro
Domain Experience: Computer Vision (CV), Artificial Intelligence, Machine Learning (AI/ML), Large Language Models (LLMs), Multimodal LLMs (MLLMs), Reinforcement Learning (RL), AI Agents / Agentic AI, Generative AI (GenAI), Deep Learning (DL), Healthcare AI