Saumya Gupta

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Education

Stony Brook University, Stony Brook, NY, USA Aug 2021 – Mar 2026
Ph.D. in Computer Science, GPA: 4.00/4.00

National Institute of Technology Karnataka (NITK) Surathkal, India Aug 2014 – May 2018
B.Tech. in Computer Science and Engineering, GPA: 9.49/10.00

Experience

Graduate Research Assistant | Stony Brook University, NY, USA May 2022 – Mar 2026
- Topology-preserving diffusion models for generating synthetic data (ICLR'25) | Python, PyTorch
- Enhanced image segmentation by proposing structural uncertainty using topology and graph neural networks (NeurIPS'23). Integrating into MONAI's active learning pipeline to optimize annotation | Python, PyTorch, C++
- Topology-aware loss function for multi-class image segmentation (ECCV'22 Oral) | Python, PyTorch

Research Scientist/Engineer Intern | Adobe Inc., CA, USA May 2024 – Nov 2024
- Working with Multi-modal Large Language Models (MLLMs) for video engagement prediction and suggestion

Graduate Teaching Assistant | Stony Brook University, NY, USA Aug 2021 – May 2022
- For the CSE303 course Theory of Computation, conducted office hours, curated questions, and graded homework

Senior Software Engineer | Samsung R&D Institute, Bangalore, India Jun 2018 – Jun 2021
- Developed a lightweight deep learning model to replace the ISP pipeline, optimizing denoising across scenes/ISO levels (commercialized in Samsung Galaxy S21) | Python, PyTorch, Tensorflow, TensorFlow Lite
- Super-resolution of 3D Ultrasound ovarian volumes upto 2x (SPIE'21 Oral) | Python, PyTorch
- Introduced security measures such as encryption and anonymization/deanonymization of PHI data in Samsung's DICOM platform to ensure HIPAA compliance | C++, PostgreSQL, OpenSSL

Undergraduate Research Assistant | NITK Surathkal, India Jul 2017 – May 2018
- Minimized the time to detect faults in Software Defined Networks (SDNs) (silent blackhole detection) | C++

Intern | Samsung R&D Institute, Bangalore, India May 2017 – Jul 2017
- Rendered a tile-based vertical scrolling approach in Vulkan to minimize the load on GPU | C, C++

Selected Publications

TopoDiffusionNet: A Topology-aware Diffusion Model
***Saumya Gupta**, Dimitris Samaras, Chao Chen* ICLR 2025

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

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

Ovarian Assessment Using Deep Learning Based 3D Ultrasound Super Resolution
***Saumya Gupta**, Venkata Suryanarayana K., Srinivas R. Kudavelly* SPIE 2021 (Oral)

Professional Activities

Peer Reviewer: AAAI, ECCV, CVPR, ICLR, NeurIPS, ICML, ISBI, DALI, TNNLS, TMI 2023-Present

Conference Tutorial & Workshop Organizer: MICCAI 2023, 2024

Instructor/Teaching Assistant: Bio-Informatics Bootcamp, Stony Brook University 2023, 2024,2025

Skills

Languages, Tools, Frameworks: Python, C, C++, Java, PostgreSQL, PyTorch, Keras, TensorFlow, OpenCV, MATLAB, Visual Studio, Git, LaTeX, Android Studio, Sony Vegas, Adobe After Effects, Photoshop

Domain Experience: Computer Vision (CV), Artificial Intelligence (AI), Deep Learning (DL), Machine Learning (ML), Topological Data Analysis (TDA), Medical Image Analysis (MI), Programming