

Srijit Mukherjee

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Research Interest

Computer Vision, Medical Imaging

Education

- 2022 – Dec, 2026 **Ph.D. in Electrical Engineering**, *Pennsylvania State University*
- **Specialization:** Computer Vision, Medical Imaging
 - **Advisors:** Prof. Vishal Monga (Penn State), Prof. Steven Schiff (Yale)
- 2019 – 2021 **Masters in Statistics**, *Indian Statistical Institute, Kolkata, India*
- **Specialization:** Theoretical Statistics
 - **Project:** Fish Length Growth Analysis Using Non-Parametric Methods
- 2016 – 2019 **Bachelors in Statistics**, *Indian Statistical Institute, Kolkata, India*
- **Project:** Statistical Learning Model for Cricketer's On-field Performance

Work and Research Experience

- 2022 - Dec, 2026 **Research Assistant**
Information Processing & Algorithms Laboratory, Pennsylvania State University
- Advisors: Prof. Vishal Monga Prof. Steven Schiff
 - Developed EnSegNet-Cross for Hydrocephalic Brain Volume Estimation from Low-Field MRI, an AI framework
 - that integrates disease-aware enhancement and cross-modal CT-guided topological learning with Meta's Segment Anything Model (SAM), to enable robust hydrocephalic brain volume estimation from low-field MRI.
 - This approach achieved state-of-the-art Dice (0.85) and Volume (0.93) scores, delivering an interpretable and clinically meaningful solution for pediatric hydrocephalus.
 - Developed GLAPAL-H: a novel Global, Local, And Parts Aware Learner for hydrocephalus diagnosis using LF-MRI,
 - achieving 87.11% accuracy for Two-Class and 90.19% for Three-Class problems, outperforming state-of-the-art while demonstrating robustness with only 40% of training data.
 - This multi-task architecture utilizes global, local, and parts segmentation branches guided by distinct regularized loss functions to capture holistic and fine-detailed features,
 - offering enhanced interpretability through Class Activation Maps that pinpoint specific infection-activating regions for valuable clinical understanding.
- Jan - June, 2022 **Research Assistant**
mdrk Consulting
- Advisor: Prof. Diganta Mukherjee
 - Reviewed ad fraud types (Spoofed Attribution, Spoofed Users) and applied detection strategies like timestamp filtering and distribution analysis.
 - Developed a probabilistic model with multivariate normal distribution and applied Mahalanobis Distance and kernel density estimation to detect outliers in installation, impression, and spoofing data, and identified 0.2% of the dataset as severe spoofing outliers, with 3.8% indicating broader fraud risks.

Publications

- Image Analysis: Classification and Segmentation*
- 2025 **Mukherjee, S., Templeton, K., et al. Hydrocephalic Brain Volume Estimation from Low-Field MRI: Topologically-Enriched Cross-Modal Enhancement and Segmentation (submitted to Journal of Neural Engineering)**
- 2025 **Mukherjee, S., Templeton, K., Yu, M., et al. GLAPAL-H: Global, Local, And Parts Aware Learner for Hydrocephalus Infection Diagnosis in Low-Field MRI . IEEE Transactions of Biomedical Engineering (2025).**, *A short introduction is available [here](#). The code is available [here](#).*
- Image Analysis: Volumetric Statistical Analysis*
- 2025 **Bajaj, U., Yu, M., Templeton, K., Mukherjee, S., et al. Hemi brain growth as a biomarker for whole brain growth (under review Journal of Neuro-Surgery).**, *The pre-print is available [here](#).*
- Topological Graph Theory*
- 2023 **Chakraborty, D., Das, S., Mukherjee, S., et al. Triangle-free projective-planar graphs with diameter two: Domination and characterization. Discrete Applied Mathematics 331 (2023): 11-24.**

Educational Projects

- 2015 - present **Educational Tutorials, Large Language Model (LLM) Apps, and Guest Speaker**
- Built educational and software tools for medical professionals like [Segment-Anything Live App](#), and [GLAPAL-H](#).
 - Created tutorials on [Transformer Architecture](#), [LLM Crash Course](#), [Deep Learning](#), and [Vision Transformer](#).
 - Developed LLM applications like [Annotated PDF Summary](#), and [Adaptive Learner App](#).
 - Delivered talks across multiple institutions and organizations, with recordings available [here](#).
 - Created a social media community of 22k+ members with content creation in Mathematics & AI.

Awards and Recognition

- 2022-2024 **Pennsylvania State University Graduate Fellowships**
- 2024 Milton and Albertha Langdon Memorial Graduate Fellowship
 - 2022-2023 Melvin P. Bloom Memorial Graduate Fellowship in Electrical Engineering
- 2014 – 2018 **Mathematics Olympiad and Competition Awards**
- 2018 Simon Marais Undergraduate Mathematics Competition Awardee
 - 2017, 2018 Madhava Undergraduate Mathematics Competition Awardee
 - 2015 Indian National Mathematical Olympiad Training Camp Participant
 - 2014 Regional Mathematics Olympiad Awardee

Academic Service

- 2022 - present **IEEE Reviewer**
- Served as a reviewer for the [IEEE ICASSP \(2022-2025\)](#), [IEEE CAMSAP \(2023\)](#), [IEEE Signal Processing Letters \(2026\)](#)

Relevant Coursework

- Mathematics Real Analysis, Complex Analysis, Abstract Algebra, Discrete Mathematics, Differential Equations, Metric Topology, Game Theory, Convex Optimization, Linear Control Systems
- Probability Probability Theory, Random Graphs, Stochastic Processes, Measure-Theoretic Probability, Martingale Theory, Weak Convergence and Empirical Processes, Random Processes
- Statistics Parametric Statistics, Linear Statistical Models, Decision Theory, Non-Parametric Statistics, Large Sample Theory, Bayesian Inference, Sample Survey, Regression Techniques, Pattern Recognition, Categorical Data Analysis, Statistical Computing, Resampling Techniques, Statistical Methods in Epidemiology and Ecology, Financial Econometrics, Time Series Analysis
- Computing Programming in C, Data Structures, Numerical Analysis, Design & Analysis of Algorithms
- Deep Learning Computer Vision I and II, Neural Networks and Deep Learning

Skills

- Programming **Python, PyTorch, OpenCV, LangChain, Transformers, HuggingFace, Streamlit, Gradio, RShiny, R, C, RStudio, L^AT_EX**