# Srikar Mutnuri

srikar.mutnuri@gmail.com
srmutnuri.dev
+1 323-334-7609

## Summary

Research centers on modeling causal interactions and information transfer in high-dimensional, dynamic systems using GNNs, time-series analysis, and large-scale agent-based simulations.

## Education

**University of Virginia, Charlottesville, USA** *Fall 24 –*
Doctor of Philosophy (Computer Science - Biocomplexity Institute)
Graph Networks, Brain Dynamics, Agent-based Models, Simulations, Contagion Spread
*Advisor*: **Madhav Marathe**

**University of Southern California, Los Angeles, USA** *Fall 21 – 23*
Master of Science (Electrical Engineering)
Haptic Design, Graph Signal Processing, Causal Learning, Optimization, Epidemics
*Advisors*: **Peter Beerel**, **Heather Culbertson**, **Ajitesh Srivastava**

**Gitam Deemed University, Visakhapatnam, India** *Fall 12 – 16*
Bachelor of Technology (Electronics and Communication Engineering)

## Research Experience

Graduate Research Assistant, **University of Virginia** *Fall 24 –*
Brain causal network dynamics, wildfire contagion models, LLM knowledge graphs, agentic models

Graduate Research Assistant **University of Southern California** *Summer 22 – 23*
Synthetic data generation using UE4 for wildfire tracking, haptic interface design for VR, real-time pose detection in video streams

## Publications

**Selected Peer-Reviewed Papers** [Google Scholar]
"Dynamic Causal Network Representations of Resting-State EEG for Cross-Task Prediction"
**Srikar Mutnuri**, Aniruddha Adiga, and others
*In preparation*, 2025

"Causal Analysis of Graph Signals for Brain Effectome Inference" [link]
**Srikar Mutnuri**, Aniruddha Adiga, and others
*Asilomar Conference on Signals, Systems, & Computers, Pacific Grove, USA*, October 2025

"Dynamics-Based Feature Augmentation of Graph Neural Networks for Variant Emergence Prediction" [link]
Majd Al Aawar, **Srikar Mutnuri**, and others
*AAAI Conference on Artificial Intelligence, Philadelphia, USA*, February 2025

"FireFly: A Synthetic Dataset for Ember Detection in Wildfire" [link]
Yue Hu, Xinan Ye, Yifei Liu, Souvik Kundu, Gourav Datta, **Srikar Mutnuri**, and others
*AI + HADR Workshop, ICCV, Paris, France*, October 2023

**Posters and Other Work**
**GSP Workshop '25**: "Causal Analysis of Graph Signals for Brain Effectome Inference" [link]
**UVA Brain Retreat '25**: "Learning Brain Structure through Causal Analysis of Graph Signals"
**UVA CS Research Symposium '24**: "Delay Prediction for COVID-19 Variant Emergence with GNNs" [link]
**USC EE Research Festival '22**: "Synthetic Dataset for Wildfire Detection" [link]
**Unpublished**: "Dense Magnet Array for MR Fluid-Based Fingertip Haptics Interface" [link]

## Teaching

**UVA CS4971, Capstone Practicum** *Fall 25*
Teaching Assistant for Prof. **Mark Sherriff**. [webpage]

**USC CSCI526, Advanced Mobile Devices and Games** *Fall 22 – 23*
Course Producer for Prof. **Scott Easley**

**USC CSCI420 Computer Graphics** *Fall 22*
Course Producer for Prof. **Andrew Nealen**

## Projects ($\alpha - \beta$)

"Predicting Political Poll Responses Using LLMs Fine-tuned On YouTube Data" *Fall 24*
Anders Gyllenhoff, **Srikar Mutnuri**, Joseph Okeno-Storms, Benjamin Pusch
CS6501 Natural Language Processing, UVA

"Modeling Responses on Social Media Posts" *Fall 24*
Anders Gyllenhoff, Stephanie Johnson, **Srikar Mutnuri**, Benjamin Pusch
CS6501 Computational Behavior Modelling, UVA

"Agent Based Network Models to Predict Influenza-Like-Illnesses" *Spring 23*
Amrith Coumaran, **Srikar Mutnuri**, Hans Walker
EE638 Applications of Machine Learning for Medical Data, USC

## Service

**Organization**
Infrastructure Co-chair for the $4^{th}$ Learning on Graphs Conference, Phoenix, USA (2025)

**Reviewer**
*Committee*: IEEE SPS Multimedia Signal Processing Technical Committee
*Conferences & Workshops*: NeurIPS, ICML, ICCV, KDD, CVPR, ACL

**Departmental/School Service**
Academic Committee Member, UVERS 2025 [webpage]

## Work Experience

*Research Associate*, **University of Southern California** *2023 – 2024*

- Worked on research into the use of networks, graphs, and dynamic models for epidemiology
- Built a custom MLOps pipeline to automate the train-test workflows, released a configurable template for use across multiple projects
- Researched the use of stochastic models and physics-informed neural networks in improving prediction accuracy

*Sr. Software Engineer - Immersive Tech*, **Tata Consultancy Services** *2016 – 2021*

- Designed and optimized ETL pipelines, frameworks, and architectures to accelerate cross-platform game & XR app performance
- Collaborated with TCS Research Labs to conceptualize and build applications for user studies
- Improved data migration speeds by building automated big-data ingestion frameworks on top of Hadoop stack

## Skills

**Engineering**: Python, C#, Java, Spark, SQL, MATLAB, Slurm, Bash, Git, CUDA, TensorFlow, PyTorch, SciPy, scikit-learn, Hugging Face, LoRA, PEFT, Docker, AWS, GCP, Unity, Unreal Engine, LaTeX

**Research**: Optimization, graph neural networks, causal inference, large-scale simulations, time-to-event modeling, dynamical systems, information flow, algorithm design, generative modeling, transfer learning, test-time adaptation, reinforcement learning