

SRINITISH SRINIVASAN

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Education

Vellore Institute of Technology

2021 - 2025

B.Tech in Computer Science & Engineering with specialization in Artificial Intelligence and Machine learning

Work Experience

University of Lincoln

Oct 2023 – Present

Computer Vision Research Intern under the supervision of Dr.Karthik Seemakurthy

Remote

- Pre-trained the YOLOv5 and YOLOv3 backbone to generate pseudo labels that accurately localizes multiple objects in an image.
- Worked on mitigating Out-of-Distribution errors in object detection during inference-time by developing a test-time transformation technique using Autoencoders and Image Inpainting.
- Implemented a method to successfully transfer backbone weights of YOLOv5 to Ultralytics YOLOv5 after custom pre-training

Vellore Institute of Technology

Sept 2023-Present

Undergraduate Student Researcher under Dr.Omkumar CU's Research Group

Hybrid

- Designed JPEB GSSL: A graph self supervised technique that combines joint predictive embedding and Bayesian inference.
- Developed the Lorentzian Graph Isomorphic Network(LGIN) to enhance graph representation learning on non-Euclidean manifolds for graph classification.
- Designed and trained Graph Variational Autoencoders to generate node embeddings that model the underlying features of a drug through Self-Supervised learning.
- Developed a contrastive training method to train GNN backbones to defend itself against Adversarial Attacks. Designed a pipeline to transfer backbone weight to a downstream classification task linked with Graph Isomorphic Networks(GIN) for molecular property predictions outperforming over 70% of previous benchmarks.

Cardiff Metropolitan University

Aug 2024 – March 2025

Computational Linguistics Intern under Dr.Raj Ramachandran in collaboration with UWE, Bristol

Remote

- Collaborated with the University of West of England in performing experiments in controlled environments to develop a toolkit towards language acceptance.
- Developed and fine-tuned Large Language Models (LLMs) to enhance contextual understanding and handle code-switching between Tamil and English.
- Using Machine and Deep Learning techniques to develop mathematical models to map qualitative details of language acceptance to a quantitative environment.
- Understanding linear and non-linear relationships between different aspects of language acceptance and understanding.

Center of Cyber Physical Systems, Vellore Institute of Technology

Aug 2023-Oct 2023

Summer Research Intern under the supervision of Dr.Ganapathy Sannasi

Hybrid

- Designed a technique to semantically segment sparse crop and weed data using hyper-spectral images during their initial growth period.
- Train and Test several state of the art semantic segmentation loss functions such as Weighted Cross Entropy, Dice Loss, Focal Loss and Dice Log-Cosh.
- Constructed a modified U-net with initial self-supervised embedding layers to capture the underlying spatial and spectral features of crop and weed.

Selected Publications

- Omkumar ChandraUmakantham, Sritish Srinivasan, and Varenja Pathak. "Detecting Side Effects of Adverse Drug Reactions Through Drug-Drug Interactions Using Graph Neural Networks and Self-Supervised Learning". In: IEEE Access 12 (2024), pp. 93823–93840. doi: 10.1109/ACCESS.2024.3407877.
- Ganapathy, S., Srinivasan, S. Crop weed separation through image-level segmentation: an ensemble of modified U-Net and encoder-decoder. Neural Comput & Applic (2025). <https://doi.org/10.1007/s00521-025-11123-7>
- Sritish Srinivasan and Omkumar CU. Leveraging Joint Predictive Embedding and Bayesian Inference in Graph Self Supervised Learning. 2025. arXiv: 2502.01684 [cs.LG]. url: <https://arxiv.org/abs/2502.01684>.
- Sritish Srinivasan and Karthik Seemakurthy. Autoencoder based approach for the mitigation of spurious correlations. 2024. arXiv: 2406.18901 [cs.CV]. url: <https://arxiv.org/abs/2406.18901>.
- Jaskaran Singh Walia et al. "Predicting Liquidity-Aware Bond Yields using Causal GANs and Deep Reinforcement Learning with LLM Evaluation". In: arXiv preprint arXiv:2502.17011 (2025)

Ongoing Publications

Liquidity-Aware Bond Yields using Causal GANs and Deep RL with LLM Evaluation	ACL
Lorentzian Graph Isomorphic Networks	ACM SIGMOD
Leveraging Joint Predictive Embedding and Bayesian Inference in GSSL	IJCNN

Projects

Lorentzian Graph Isomorphic Network [Source Code](#)

- Developed a novel graph neural network that extends Graph Isomorphic Networks (GIN) to hyperbolic spaces using the Lorentz model, enhancing expressivity for distinguishing non-isomorphic graphs
- Proposed a theoretical framework for powerful graph neural networks on hyperbolic spaces that follow the hyperbolic-tangential-hyperbolic transformation and a cardinality-aware Lorentz centroid aggregation function to approximately preserve its injectivity.

JPEB G-SSL: Leveraging Joint Predictive Embedding and Bayesian Inference in Graph SSL [Source Code](#)

- Developed a non-contrastive self-supervised learning framework to improve graph neural network representations without relying on negative sampling or complex decoders.
- Incorporated a semantic-aware objective using pseudo-labels derived from Gaussian Mixture Models (GMMs), enhancing node discriminability by evaluating latent feature contributions.
- Achieved state-of-the-art results on benchmark datasets by bridging spatial and semantic graph features while ensuring computational efficiency and resistance to representation collapse.

Molecular Property Prediction using Contrastive Self Supervised Learning and GIN [Source Code](#)

- Designed a contrastive pre-training approach based on model perturbation and information loss to pre-train a Graph Convolution based encoder on 250,000 molecules.
- Used the pre-trained model as prior and attached a graph isomorphism framework to predict the chemical, physiological and biological properties of molecules on MoleculeNet benchmarks.
- Developed an adversarial attack strategy using the edge sensitivity of adjacency matrices to test the robustness of Graph Isomorphic Networks (GIN) and Spectral Graph Convolution Networks.
- Achieved an Average AUC of 85% with only 835,000 parameters outperforming 70% LLM benchmarks.

Real Time Surgical Smoke Detection using Graph Neural Networks and 3D CNNs [Source Code](#)

- Designed a Graph Neural Network and a 3D CNN based feature extractor to detect smoke in surgical videos.
- Used the features extracted by the 3D Convolution Neural Network as the node embeddings of the graph and the position of the frames in time to create the graph adjacency matrix.
- The graph was dynamically created during training enabling the exploration of a wide range of features.

Differential Equations using Equilibrium Driven Neural Networks [Source Code](#)

- Implemented a numerical solution using neural networks to solve ordinary and partial differential equations.
- The implementation takes consideration of mathematical constraints such as Dirichlet and Neumann Boundary Conditions.

Self Supervised Psuedo-labelling using Autoencoders built on YOLOv5 Backbone [Source Code](#)

- Pre-trained the YOLOv5 backbone to precisely localize multiple objects within an image.
- Designed a pipeline to successfully transfer the pre-trained backbone weights to Ultralytics YOLOv5 for fine-tuning.

Mitigation of Spurious Correlations in YOLOv5 [Source Code](#)

- Identified patterns in miss-classified instances of YOLOv5 using Self-Supervised Learning.
- Used Image Inpainting labels as weak labels and developed an Autoencoder to correct miss-classified instances through Test time Transformation, thus effectively adapting to the OOD setting.

Honors and Achievements

- Finalists in AgriTech Robo Challenge, a competition hosted by Erasmus Agrhi of VIT as a part of the International Conference on Digital Technologies for Sustainable Agriculture, 2024. We were among the top 5 teams selected from over 200 teams across 3 rounds of evaluation.
- Awarded a scholarship to attend the Oxford Machine Learning Summer School on Deep Representation Learning
- Selected for the Raman Research Award by Vellore Institute of Technology
- Winner of TechEthos Hackathon conducted by Data Science Club, VIT Chennai in collaboration with University of Cardiff on low resource language translation
- Selected for John Hopkins HEEP Program at Whiting School of Engineering as a visiting student
- Invited as a keynote speaker at Vellore Institute of Technology for a seminar on Temporal Graph Neural Networks and was awarded a certificate in recognition of expertise in graph-based deep learning
- Invited to speak at Google IO Extended conducted by Google Developers Student Clubs on the topic of Palm API, Mediapipe and Quantization
- Appointed as Lead for Indian Institute of Technology, Madras, Student Council for the Data Science and Applications Course