Jayadratha Gayen

jayadratha.gayen@research.iiit.ac.in | Linkedin | Github | Google Scholar | Portfolio

Research Interests

Graph representation learning, graph neural networks, geometric deep learning, temporal graph networks, knowledge graphs, molecular property prediction, molecular generation, uncertainty optimization, explainable AI

Education

International Institute of Information Technology, Hyderabad — Hyderabad, India
M.Sc in Electronics and Communication Engineering by Research (CGPA: 8.29/10) — *July 2022 - July 2025*

Indian Institute of Engineering Science and Technology, Shibpur — Howrah, India
Bachelor of Technology in Electrical Engineering (CGPA: 8.02/10) — *July 2014 - June 2018*

Research Experience

Research Fellow — Nov 2022 - Present
Machine Learning Lab - MLL (IIITH) — *Hyderabad, India*

- worked in graph neural network (GNNs), uncertainty management, 3D vision
- Conducted research on GNNs, high-stakes applications like legal judgment prediction, disease prediction; accepted at TMLR 2025, DAI AAAI 2025
- Explored continuous time dynamic graphs (CTDGs), reject option classification; submitted in ASONAM 2025, TGL KDD 2025
- Worked on 3D computer vision application for pose transfer and motion transfer

Publications

1. **Reducing Misclassification Risk in Dynamic Graph Neural Networks through Abstention**
   Accepted at ASONAM 2025
   Jayadratha Gayen, Himanshu Pal, Naresh Manwani, Charu Sharma
   [ArXiv]

2. **Confidence First: Reliability-Driven Temporal Graph Neural Networks**
   Accepted at KDD 2025 Temporal Graph Learning (TGL) Workshop
   Jayadratha Gayen, Himanshu Pal, Naresh Manwani, Charu Sharma
   [Openreview, ArXiv]

3. **Node Classification With Reject Option**
   Accepted at TMLR 2025
   Uday Bhaskar, **Jayadratha Gayen**, Charu Sharma, Naresh Manwani
   [Paper Link]

4. **Node Classification With Integrated Reject Option For Legal Judgement Prediction**
   Accepted at AAAI 2025 Deployable AI (DAI) Workshop
   Uday Bhaskar, **Jayadratha Gayen**, Charu Sharma, Naresh Manwani
   [Paper Link]

Work Experience

Software Developer — May 2025 - Now
Google Summer of Code — *Remote*

- **Project:** DevoTG: Dynamic Graph Neural Networks for Modeling C. elegans Development.
- Model C. elegans embryogenesis and connectome formation using advanced temporal graph methods.

Engineer — July 2018 - Dec 2019
Vikram Solar Limited — *Falta, West Bengal, India*

- Contributed to a Six Sigma project on rolled throughput improvement, increasing production by 10%.

- Involved in bottleneck analysis, DOE in Minitab, and Pareto, Five Why, and Fishbone analyses to optimize production quality.
- Analyzed technical data to decide current binning for all module types and introduced RFID tag automation, reducing manual errors. Utilized SAP and extensive Excel analysis for data management and insights.
- Led root cause analysis and KAIZEN projects, achieving a 2% reduction in power consumption.

Selected Projects

Node Classification With Integrated Reject Option 2024

[Paper Link]

- Introduced a novel graph neural network framework, NodeCwR, incorporating cost-based and coverage-based rejection strategies to enhance the reliability of Legal Judgment Prediction (LJP) and disease prediction tasks.
- Achieved a 6-19% improvement in prediction accuracy on the ILDC dataset for LJP and abstaining from uncertain cases.
- Enhanced interpretability of the rejection decisions using SHAP visualizations.

Predict Confidently, Predict Right: Abstention in Dynamic Graph Learning 2024

[Paper Link]

- Developed a novel reject option strategy for CTDGs, allowing the model to abstain from uncertain predictions, enhancing reliability in link prediction and node classification tasks
- Achieved 10-15% improvement in AUC/AP scores across six dynamic graph datasets, effectively addressing class imbalance and critical misclassification
- Demonstrated the model's effectiveness through exhaustive experiments in dynamic and risk-sensitive domains such as fraud detection and disease prediction.

3D Motion Transfer Across Diverse Character Topologies 2023

[Project Output]

- Developed a novel method using Graph Convolution Networks (GCN) for realistic 3D motion transfer between diverse character topologies, including humanoids and quadrupeds.
- By incorporating prior frame encodings, the approach reduces jitter and ensures smoother, natural animations.
- The method outperforms traditional pose transfer techniques, especially on complex characters, as shown on the Mixamo dataset.

Multilingual News Article Similarity Detection Using Siamese Networks 2022

[Project page]

- Developed a multilingual news article similarity detection system using a Siamese architecture.
- Three models were implemented: TF-IDF with MLP, GloVe with LSTM, and multilingual DistilBERT, achieving the best result with DistilBERT (PCC: 0.5683).
- The system excels in cross-linguistic news comparison, outperforming baseline models in SemEval 2022 Task 8.

Teaching Experience

Teaching Assistant May 2023

3D Vision Summer School *CVIT, IIIT Hyderabad, India*

- Conducted a tutorial on graph neural networks, their current progress, and case studies on the usage of GNNs for 3D vision especially mesh-based systems.
- Taken doubt-solving sessions in GNNs and 3D vision concepts for the participants.

Instructor October 2023

Executive Training Program on AIML *ihub-data, IIIT Hyderabad, India*

- Coordinated in two-weeks executive training program on machine learning and artificial intelligencce.
- conducted tutorials concepts like PCA, end-to-end ML model building. Also taken doubt-solving sessions.

Technical Skills

Languages: Python, C++, C, SQL
Developer Tools: GitHub, VS Code, Conda, Poetry
Libraries: PyTorch, PyG, scikit-learn, TensorFlow, Keras, Transformers
Softwares: Blender, MeshLab, Minitab, MATLAB Simulink

Relevant Courses

Topics in Deep Learning, Computer Vision, Statistical Methods in AI, Applied Optimization, Linear Algebra, Calculus, Probability & Statistics, Digital Signal Processing

Extracurricular & Participation

- **Founding Member, Srijani - The Hope:** Started an independent non-profit NGO focused on improving education and healthcare in remote areas of West Bengal, India, with limited accessibility. *(Mar 2020- Apr 2022)*
- Participated in LoG Delhi Meetup, November 26, 2024
- Attended 8th Summer School on AI, IIIT Hyderabad, July 2024

References

Below are individuals who can vouch for my skills, expertise, and contributions:

- **Prof. Charu Sharma *(Preferred)*** - Assistant Professor, Machine Learning Lab, IIIT Hyderabad - charu.sharma@iiit.ac.in
- **Prof. Anindita Sengupta** - Head, Electrical Engineering, IIEST Shibpur - hod@ee.iiests.ac.in
- **Prof. Naresh Manwani** - Assistant Professor, Machine Learning Lab, IIIT Hyderabad - naresh.manwani@iiit.ac.in