Priyanka Gautam

Ph.D. Student at Kansas State University, Kansas, USA

Kansas, United States Portfolio

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Priyanka Gautam is a 3 year Ph.D. student in Electrical and Computer Engineering at Kansas State University, specializing in foundation models for graphs and time series data. With over three years of experience in finance and IT, she combines academic expertise with industry knowledge to develop innovative AI applications. Her proficiency in predictive modeling, advanced data analytics, and data visualization allows her to effectively translate complex datasets into actionable insights, significantly benefiting business processes and strategic decision-making.

Professional Experience

- **Data Science Analyst — Accenture Applied Intelligence, Gurugram, India** (2021 - 2022)

  - Engineered an automated tool to optimize workforce management by analyzing job roles and hiring patterns. This initiative projected a 50% increase in task automation and streamlined budgeting for workforce expansion over the next five years based on market trends.

  - Enhanced the accuracy of job classification models to 90%, applying intelligent augmentation techniques. This improvement in model performance significantly boosted hiring prediction capabilities.

  - Employed Python, NLP, machine learning, and Power BI for developing advanced analytics and workflow planning solutions, enhancing data-driven strategic decisions.

- **Data Science Consultant — Eclerx Service Ltd., Mumbai, India** (2019 - 2021)

  - Streamlined loan processing by developing automated tools for document extraction and classification, improving accuracy by 94% and reducing loan approval times by 60%, resulting in increased customer satisfaction and operational efficiency for banking clients.

  - Enhanced talent acquisition in the banking sector by creating a Flask-based API using a hybrid NLP model, improving resume parsing accuracy to 92% and reducing recruitment cycle times by 50%, enabling banks to quickly identify and onboard top financial talent.

  - Bolstered bank security measures by implementing an API for personal image classification using YOLOv3, achieving 99% accuracy in identifying authorized personnel and potential security threats, significantly reducing the risk of unauthorized access to sensitive financial areas.

  - Optimized financial data management by building an ETL pipeline for efficient data extraction from data lakes, enabling real-time pricing predictions and risk assessments, which improved banks' decision-making processes and regulatory compliance.

- **Data Science Consultant — Morgan Stanley - Client, Remote, India** (2019 - 2021)

  - Developed an ETL pipeline to extract end-of-day closing stock prices from data lakes and Hadoop clusters, enhancing data compatibility for multi-regional pricing predictions.

  - Assisted in building predictive models to analyze stock price movements across different regions, comparing opening and closing prices to identify market trends.

  - Created comprehensive analytics reports comparing stock performance across various regions, providing valuable insights for investment strategies.

  - Collaborated with senior analysts to present findings, contributing to more informed decision-making in global stock trading operations.

Research Experience

Research Graduate — Kansas State University, Kansas, USA (2022 - Current)

- **Graph-Theoretic Models for Critical Infrastructure Robustness & Resilience:**

  - Developed a comprehensive model for evaluating the robustness of interconnected infrastructure systems, encompassing sectors such as power, water, transport, and emergency services.

  - Achieved node classification accuracy of 97.24% and link classification accuracy of 99.01% in a network of over 1,300 nodes serving a coastal community of 500,000 residents.

  - Published two research papers to validate the theoretical concepts underpinning our models.

- **Synthetic Hetero-functional System Development:** (Manuscript in Progress)

  - Engineered a heterogeneous functional graph framework to simulate and analyze multi-infrastructure dependencies and their impacts on society.
  - This model significantly advances traditional isolated system studies by facilitating complex dependency analyses across diverse infrastructure sectors.

- **Influence Maximization in Dynamic Networks:**

  - Implemented a GNN-LSTM model integration for dynamic influence maximization, effectively adapting to both structural and temporal changes.
  - Enhanced prediction accuracy for potential seed nodes by over 85%, thereby reducing computational overhead and improving the efficiency of influence strategies in various applications, including marketing and public health campaigns.
  - Manuscript under review titled "GNN-Based Candidate Node Predictor for Maximizing Influence in Dynamic Graph." [NeuroComputing Jorunal]
  - Developed a novel Causal Influence Maximization algorithm that integrates causal inference techniques with network analysis using Causal learning techniques [Manuscript under progress]

- **Change Point Detection in Dynamic Network Structures:** (Work in Progress)

  - Developing algorithms to detect significant structural changes in dynamic networks, aiming to proactively address and mitigate potential disruptions.
  - Focused on analyzing network behavior to identify critical change points, crucial for optimizing the timing of influence maximization algorithms to enhance infrastructure system robustness.

Education

2022- Current	**Ph.D. in Electrical & Computer Engineering**, Kansas State University, USA (GPA: 3.9/4) [Expected Graduate -December 2025]
2017 - 2019	**Masters in Computer Science & Engineering**, IIT Gandhinagar, India (CGPA: 7.6/10)
2012 - 2016	**B.Tech in Information Technology**, AKTU University, India (75%)

Technical Skills

- **Programming:** Python, C, MATLAB, Julia, R, JavaScript, SQL, CSS, HTML

- **Libraries/Tools:** Pycharm, Pytorch, Tensorflow, Jupyter, Spyder, GCP, Dataiku, Gurobi, Git, PowerBI

- **Languages:** English (fluent), Hindi (native), Punjabi (intermediate)

Certifications

- **Machine Learning Specialist** (2020), Issued by LinkedIn Learning - [Certificate]

- **Dataiku Core Designer** (2020), Issued by Dataiku - [Certificate]

Publications

1. P. Gautam, A. Sreejith, and B. Natarajan, "A Transductive Graph Neural Network learning for Grid Resilience Analysis," 2023 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Glasgow, United Kingdom, 2023, pp. 1-6, doi: 10.1109/SmartGridComm57358.2023.10333912. [Link]

2. P. Gautam and B. Natarajan, "GNN-based Criticality Analysis in Interconnected Infrastructure Networks," 2024 IEEE Green Technologies Conference (GreenTech), Springdale, AR, USA, 2024, pp. 213-217, doi: 10.1109/GreenTech58819.2024.10520547. [Link]