Nilanjana Debnath

+91 8240203700 | nilanjana.debnath24@gmail.com | linkedin.com/in/nilanjana-debnath | github.com/Nilanjana-debnath | Portfolio

Skills

Programming Python
ML & DL PyTorch, TensorFlow, Scikit-learn, Hugging Face
GNNs PyG, PyGT, DGL, GraphSAGE, GCN, GAT, TGN
NLP BERT, GPT, T5, RoBERTa, NLTK, SpaCy, Gemini API
Computer Vision OpenCV, YOLO, Detectron2
MLOps ONNX, MLflow, Docker, CI/CD
Cloud AWS (S3, SageMaker, Lambda)
Data Engg & Viz Pandas, NumPy, Matplotlib, Seaborn, SQL

Education

Degree	**M.S. (Research)**	2021–2025
Field	Computer Science and Engineering	
Institute	Indian Institute of Technology (IIT) Palakkad	
CPI	9.25/10.0	
Degree	**B.Tech**	2015–2019
Field	Information Technology	
Institute	Kalyani Government Engineering College	
CPI	8.49/10.0	

MS Thesis: Heterogeneous Continuous-Time Dynamic Graph Representation Learning

MS-Thesis : Heterogeneous Continuous-Time Dynamic Graph Representation Learning (HT-Graph) **2022 – 2024**

- Developed a model to address challenges in large, dynamic, heterogeneous graphs by improving prediction performance and computational efficiency.
- Implemented **HT-Graph** using neighbor-aware learning, **neighbor-store**, and **restarter** modules to enable parallel training and faster computations.
- Achieved **46.3% speedup** over baseline models on a 2-GPU machine and improved average precision (AP) and AUC scores.
- **Skills:** Python, PyTorch, PyTorch-Geometric, Deep Graph Library (DGL), Graph Neural Networks, Dynamic Graph Neural Networks.

Projects

Human Activity Recognition on UCF-50 Dataset using PyTorch **Activity-Recognition**

- Developed a human activity recognition system for video data using a combination of Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks.
- convLSTM and LRCN models were used to extract spatial features from video frames and model temporal dependencies.
- Evaluated model performance using accuracy and loss metrics; found that LRCN outperformed convLSTM models in terms of classification accuracy (i.e. 92 % and 89 % respectively).
- Deployed the trained model for real-time human activity recognition using live webcam feed.
- **Skills:** PyTorch, CNN, LSTM, Human Activity Recognition, Computer Vision, Deep Learning.

Traffic Forecasting on Metropolitan LA Dataset using PyGT **Traffic-Forecasting**

- Built a traffic forecasting model using Temporal Graph Neural Networks (TGNNs) to predict traffic speed in real-time based on spatial and temporal data.
- Implemented an Attention Temporal Graph Convolutional Network (A3TGCN) to capture both spatial and temporal patterns.
- Conducted data preprocessing, model training, and evaluation, achieving accurate traffic speed predictions.
- Implemented both single-shot and autoregressive prediction methods for traffic forecasting.
- **Skills:** PyTorch, PyTorch-Geometric-Temporal (PyGT), Temporal Graph Neural Networks, Traffic Forecasting, Deep Learning.

Deepseek PDF Chat: AI-Powered PDF Query System Using LangChain and Ollama **Chat-with-pdf**

- Built a PDF-based question-answering system using LangChain, leveraging text chunking, embedding generation, and vector storage for efficient semantic search and retrieval-augmented generation (RAG).
- Integrated a Streamlit-based UI with the Deepseek language model (deepseek-r1:1.5b) via langchain-ollama, enabling real-time, context-aware query responses.
- **Skills:** Python, LangChain, Ollama, Streamlit, NLP, Vector Databases, PDF Processing, Semantic Search

Professional Experience

Systems Engineer @ Tata Consultancy Services **June 2019 - July 2021**

- **Analyzed user interaction data** using Azure Log Analytics to uncover usage trends and identify performance bottlenecks.
- Built interactive Azure dashboards for real-time KPI monitoring (e.g. session duration, click-through rates, crash analytics etc)
- Collaborated with the product team to implement changes based on insights, such as improving navigation flows, which increased feature engagement by 20%.
- Analyzed the effectiveness of UI changes, resulting in a 15% improvement in retention and a 10% reduction in drop-off rates.
- **Automated Azure VM management** using PowerShell scripts and Azure Automation, reducing manual intervention by 90%.
- Consolidated and standardized VM metadata from multiple CSV sources into a master list for efficient tracking and reporting.
- Automated VM running status, software updates, installations, and configurations for thousands of Azure VMs.
- **Skills Used:** Azure Log Analytics, KQL, Azure Dashboards, Data Analysis, User Experience Optimization, PowerShell, Azure Automation, Scripting, Software Management.