Niloy Kumar Kundu

niloykk.connect@gmail.com +8801759081828 niloykumarkundu.github.io
NiloyKK Niloy Kumar Kundu NiloyKumarKundu

Professional Experience

Detailed Experience

Junior Machine Learning Engineer *Dec 2023 – Present*
Nodes Digital Limited *13 Months*

- **Workflow Automation:** Designed and implemented workflow automation solutions using n8n to streamline data handling and improve efficiency. Automated the extraction of data from databases and formatted it for seamless Exploratory Data Analysis (EDA), reducing manual workload time from 2 hours to 1 second. Additionally, developed a one-click solution to automate testing of the entire production server, cutting down testing time from 3–4 hours to just 2.9 seconds. These innovations significantly enhanced productivity and operational efficiency.
- **Cost-Effective Water Ammonia Prediction:** Developed a machine learning-based water ammonia prediction system to replace costly ammonia sensors. The system leverages easily measurable water quality parameters to deliver accurate and scalable predictions of ammonia levels. Integrated Metabase for advanced data analysis and visualization, and utilized MLflow for robust experiment tracking and model monitoring, ensuring continuous optimization and reliability of the predictive system.
- **Agri Advisory:** Built a multilingual system where users ask agri-related questions via text or audio (Bangla/English). Integrated a vector database (Pinecone) for information retrieval and an LLM (LLama 3.2) to generate responses in text and speech.
- **Water Height Estimation of Rice Growing Field:** Developed and implemented advanced computer vision and regression models to estimate water height in rice fields with precision. This innovative approach enabled accurate and automated water height measurements, revolutionizing irrigation management. The system supports optimized water usage, reduces manual intervention, and promotes sustainable agricultural practices.
- **ML Backend Framework Development:** Led the development of a comprehensive machine learning framework designed to integrate multiple models seamlessly. The framework utilizes FastAPI for efficient communication between models and incorporates robust authentication mechanisms, including JWT token authentication. Adhering to standard procedures and object-oriented programming (OOP) principles, the project is managed with Git for version control, containerized using Docker, and includes partial deployment processes.

Research Assistant *July 2023 – Jan 2024*
Institute of Advanced Research *6 Months*

- Classification of lung cancer subtypes (Adenocarcinoma vs. Squamous Cell Carcinoma) using CT scan images.
- Collected and processed CT scan medical images from hospital sources for analysis.
- Extracted 110 radiomics features (shape-based and wavelet-based) from CT scan data.
- Applied RFE and LASSO regression to select the top 15 most important features.
- Applied Decision Tree for classifying lung cancer subtypes.

Academic Credentials

United International University *Jan 2019 – Sept 2023*
B.Sc in Computer Science and Engineering

- **GPA:** 3.87/4.00
- **Thesis:** An Improved Efficient Channel Attention Guided Deep CNN-BiLSTM-based Multi-Lingual Speech Emotion Recognition Framework
- **Thesis GPA:** 4.00/4.00

Publications

Accurate Water Level Monitoring in AWD Rice Cultivation Using Convolutional Neural Networks Sept 2024

Ahmed Rafi Hasan, ***Niloy Kumar Kundu***, Saad Hasan, Mohammad Rashedul Hoque, Swakkhar Shatabda
https://doi.org/10.48550/arXiv.2412.08477

Attention Based Feature Fusion Network for Monkeypox Skin Leison Detection Dec 2023

Niloy Kumar Kundu, Mainul Karim, Sarah Kabir, Dewan Md. Farid
https://doi.org/10.1109/ICCIT60459.2023.10441278

Implementing Federated Learning based on RainForest Model April 2023

Mainul Karim, ***Niloy Kumar Kundu***, Dipu Saha, Sarah Kabir, Sumaiya Akter Mim, Dewan Md. Farid
10.1109/I2CT57861.2023.10126333

Skills

Programming Languages

- **Proficient:** Python, C/C++.

MLOps

- **Machine Learning & Deep Learning Frameworks:** TensorFlow, Keras, PyTorch, SK-Learn.
- **Data Science Tools:** Numpy, Pandas, Matplotlib, OpenCV.
- **Deployment & Operations:**
  - **Containerization & Orchestration:** Docker.
  - **Web Server & Reverse Proxy:** Nginx.
  - **Version Control:** Git & GitHub.
  - **Experiment Tracking & Monitoring:** MLflow.

”originatingScript”:”m2”,”payload”:”guid”:”164d23a2-c1df-4973-8855-8645abf1d85a4796a0”,”muid”:”eeae7b3c-2530-44fa-a93a-b42953b23215cfc743”,”sid”:”25bd93ef-55ee-441c-869b-654dfa307a62150c61”

Natural Language Processing (NLP) & Large Language Models (LLMs)

- **Frameworks:** LangChain, LangGraph.

Backend & Frontend Development

- **Frameworks:** FastAPI, Django, Vue.js, Streamlit.

Data Management

- **Databases:** SQL, SQLite.
- **Vector Database:** Pinecone.

Project Management, Research & Development

- **Tools:** ClickUp, Zotero, Kaggle, Google Colab, Jupyter Notebook, LaTeX, VS Code.

References

Dr. Swakkhar Shatabda *Dept. of CSE*
Professor *BRAC University*
Email: swakkhar.shatabda@bracu.ac.bd