Birat Poudel

Data Scientist | AI/ML Engineer | Data Engineer | Backend Engineer (Python | Java)

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About Me

Proficient Machine Learning and Backend Engineer with hands-on experience in designing and developing robust systems. Skilled in creating comprehensive machine learning and backend solutions to address real-world challenges effectively.

Technical Skills

Programming	C/C++ · Java · Python · JavaScript · TypeScript
Python Libraries	NumPy · Pandas · Scikit-Learn · Matplotlib · Seaborn
ML Frameworks	Tensorflow · PyTorch
Backend	Spring Boot · Flask · Django · FastAPI
Frontend	HTML/CSS · ReactJS · NextJS · Redux
Database	MySQL · PostgreSQL · MongoDB · Redis
Others	Docker · Kubernetes · Firebase · AWS

Experience

Leapfrog Technology — *Kathmandu, Bagmati, Nepal*

AI/ML Engineer — *May 2024 - Present*

- Built AI systems, including **IVR (Interactive Voice Response) and Conversational Voice AI** for medical patient follow-ups and referrals.
- Created **Model Evaluations PDF Report Generator Pipeline** for systematic evaluation delivery.
- Developed and maintained **AI Agents Frameworks** and **MCP Servers** for scalable agent orchestration.

Jobsflow.ai — *Kathmandu, Bagmati, Nepal*

ML Engineer — *Dec. 2024 - May 2024*

- Built AI systems, including an **AI Voice Interviewer** and an intelligent **Chatbot** capable of making tool calls to over ten plus services like Google Calendar, Meet, Gmail, Zoom, etc.
- Developed algorithms for calculating **match score** of a particular applicant for a job based on job descriptions and applicant's resume and answers for the job related questions.
- Implemented **contextual searching, filtering and sorting** using embeddings to enhance candidate selection accuracy.

Fusemachines — *Kathmandu, Bagmati, Nepal*

ML Engineer — *3 months | Sep. 2024 - Nov. 2024*

- Preprocessed and transformed datasets using **NumPy** and **Pandas**, applying advanced **feature engineering** techniques for time series forecasting and machine learning applications.
- Designed and implemented ML models, including **SARIMA**, **LSTM**, **Prophet**, and **XGBoost**, for time series forecasting and predictive analytics, achieving a 15% improvement over previous models.
- Enhanced **RAG-based** systems by optimizing vector storage and retrieval.

Maven Solutions Pvt. Ltd. — *Kathmandu, Bagmati, Nepal*

Associate Software Engineer (ML and Backend) — *1 year | April. 2023 - April. 2024*

- Worked on data preprocessing and feature engineering using libraries like **NumPy** and **Pandas** to prepare datasets for model training.
- Developed and implemented machine learning algorithms using libraries such as **Scikit-Learn** for tasks like classification, regression, and clustering achieving an accuracy improvement of 15% over previous models.
- Orchestrated the development and seamless integration of backend APIs (**FastAPI**), collaborating closely with cross-functional teams to enhance application functionality and performance.

Freelancehourly Pvt. Ltd. (formerly TechVocal) *Bengaluru, Karnataka, India*

Software Engineer (ML and Backend) *1 year | Feb. 2022 – Feb. 2023*

- Utilized deep learning frameworks like **TensorFlow** to build and train neural networks for tasks like image classification, natural language processing, and time series forecasting.
- Demonstrated expertise in backend logic implementation (**Flask**, **Django**), contributing significantly to API design and optimization initiatives.
- Employed advanced **automation scripts** and conducted precise **web scraping** operations to streamline workflows and gather mission-critical data efficiently.

Certifications

Machine Learning Specialization
Certificate Link:
coursera.org/account/accomplishments/specialization/2HMG68ZZHEVA

Web Development Specialization
Certificate Link:
coursera.org/verify/specialization/G4HWQNSPNDTU

Education

Thapathali Engineering Campus *Thapathali, Kathmandu*

Bachelor of Electronics, Communication and Information Engineering *2019 – 2023*

Relevant Courses: AI, Probability & Statistics, Discrete Structures, Big Data and Web Development.

Portfolio

Automobile License Plate Detection and Recognition | OpenCV, Convolutional Neural Network (CNN), Inception-ResNet-v2, YOLOv8, Google Tesseract and Flask

- Utilized **Inception-ResNet-v2** for accurate and efficient license plate detection, achieving real-time processing capabilities, and experimented with **YOLOv8** to explore alternative detection methods.
- Leveraged **Google Tesseract** to accurately extract and recognize text from detected license plates, and developed a **Flask**-based backend to support seamless user interaction and data processing.

https://github.com/Birat-Poudel/Automobile-License-Plate-Detection-and-Recognition

Nepali Sign Language Recognition and Translation into Text and Speech using Open CV and CNN | OpenCV, Convolutional Neural Network (CNN)

- Trained the **CNN Model** with custom images dataset. At present total of 14 sign gestures were recognized and the output was converted to text and speech.
- Number of image samples per gesture: 2800, Number of training samples per gesture: 2100, Number of test samples per gesture: 700, Model was trained for 10 epochs, and model accuracy was about 93.41%.

https://github.com/Birat-Poudel/Nepali-Sign-Language-Recognition-and-Translation

Vector Search, Databases and Retrieval Augmented Generation (RAG) Projects

GitHub Link: https://github.com/Birat-Poudel/Vector-Search-RAG-Projects

1. **Semantic Search for Movie Database**
   - Implemented a semantic search feature to find movies using natural language queries. Utilized
2. **Gemma Model Document Q&A**
   - Developed a Document Q&A project using Gemma Model, Langchain and Streamlit.

Hugging Face sentence-transformers model and **Atlas Vector Search.**

Utilized **Google Generative AI Embeddings** and **FAIS Vector Store**.

Modeling Conversational Empathy using Transformer based Model for Automating Customer Call Support | **Natural Language Processing (NLP), Text to Speech (TTS), Speech to Text (STT), Transformer Architecture**

- **Transformer-based** model was utilized for Intent Classification, Sentiment Analysis, and Query Response Generation.
- Utilized open source dataset for training and fine tuning purposes, Pretrained Transformer model for TTS and STT systems was leveraged.
- https://github.com/Birat-Poudel/Conversational-Computational-Empathy

Machine Learning Projects

GitHub Link: https://github.com/Birat-Poudel/Machine-Learning

1. **Titanic Survival Prediction**
- Performed **Exploratory Data Analysis** on Titanic Dataset and obtained valuable insights from the dataset. Implemented a **Decision Tree Classifier** model to predict survival.

2. **Breast Cancer Classification**
- Developed a **Logistic Regression** model to classify breast cancer using 30 input features, achieving a training accuracy of 94.72% and testing accuracy of 92.98%.

3. **Automobile Price Prediction**
- Developed and evaluated automobile price prediction models using **Linear, Ridge, and Lasso Regression**, with the Lasso model achieving the best performance on testing data (R-squared = 0.8709).

4. **Supermarket Sales Prediction**
- Implemented an **XGBoost Regressor** model to predict supermarket sales. Fine-tuned the hyperparameters using **GridSearchCV** and increased the test accuracy by about 10%.

Natural Language Processing (NLP) and Computer Vision (CV) Projects

1. **SMS Spam Classifier**
- Implemented Word Cloud generation, Text featurization and built model using **Multinomial Naive Bayes.**
- GitHub Link: https://github.com/Birat-Poudel/Natural-Language-Processing-Projects

2. **Pokemon Image Classification**
- A multi-class classification project. No. of classes = 3 (Pikachu, Bulbasaur, Charmander)
- GitHub Link: https://github.com/Birat-Poudel/Pokemon-Image-Classification

IPL Dashboard | Cricket match and team analytics dashboard | **ReactJS, Spring Boot, MySQL**

- Read, processed and wrote data from CSV file to **MySQL** database using **Spring Batch.**
- Implemented business logic, API endpoints and User Interface (Home, Team and Match page).
- https://github.com/Birat-Poudel/IPL-Dashboard