

MIRAJ DEEP BHANDARI

Eager Data Science enthusiast with a passion for applying academic knowledge to drive meaningful insights, possessing strong problem-solving skills, and seeking opportunities for growth and advancement in a dynamic organization.

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TRAININGS :

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| • AI FellowShip Fuse Machines | <i>Fuse Machines / 2023–2024</i> |
| • Artificial Intelligence Training | <i>Broadway Infosys / Jun 2023 – Sep 2023</i> |
| • Python Django Training | <i>Broadway Infosys / 2024</i> |
| • Data Science Intern | <i>Oasis Infobyte / Sep 2023 – Oct 2023</i> |

EDUCATION :

Secondary Education	Green Lawns Academy / Kathmandu
Higher Secondary Education	Everest Innovative College / Kathmandu
Bachelor's	Islington college / Kathmandu

TECHNICAL STACK :

- **Data Science / Machine Learning / Deep Learning**
Python OOP, Data Preprocessing, Data Visualisation, Supervised Learning Algorithms, Unsupervised Learning Algorithms, EDA, Feature Engineering, Feature Selection Techniques, ANN ,CNN, RNN, NLP, GAN, Transformers, LLM, Langchain, AI Agents.

- **Mathematics for ML & DL**

Linear Algebra, Probability, Statistics, Calculus and Matrices.

- **Python Packages and Frameworks**

Scikit-Learn, Tensorflow, Pytorch, Pytorch Lightning, Keras, Numpy, Pandas, Matplotlib, Seaborn, Plotly, Beautiful Soup, Selenium, NLTK, Spacy, Scipy, StreamLit, Django, FastApi, PyShark, Audrino IDE, Tinker, Langchain, LangGraph.

- **Computer Vision Frameworks**

Open CV, YOLO, Media Pipe, DLIB.

- **Programming Languages**

Python, JAVA OOP, .net , JavaScript.

- **Web Development**

HTML, CSS, JS, MERN Stack, JAVA JEE, JQuery, BootStrap, Figma, Django, Flask, FastAPI, Jinja, SQL, ORACLE, .net Blazor, GIT, RESTFUL APIs.

Projects :

Inbrowser Protection (ONLINE EXAM CHEATING PREVENTION):

Develoed an advanced browser-based protection system to prevent online threats by incorporating gaze detection, movement tracking, and audio noise analysis to swiftly identify potential risks. Utilizing real-time monitoring of tab activities, cursor movements, recording attempts, and HDMI cable connections to prevent screen sharing and cheating. Employing cutting-edge CNN, RNN, and ML algorithms for anomaly detection to ensure high accuracy in threat identification. Enhancing security through comprehensive data analysis and advanced ML techniques, continuously adapting to emerging threats and evolving attack vectors. Implementing a user-friendly interface with intuitive controls and continuous monitoring, providing users with peace of mind while browsing the web securely.

Large Language Model (LLM):

- Fine-tuned LLAMA2-3, Mistral, and Gemma large language models and use it according to the Business usecases.
- Implemented quantization techniques like **LORA**, **QLORA**, **GGML**, and **GGUF** for large parameter models, performing CPU-based model inference locally, and produced a detailed PDF with mathematical explanations.
- Developed an end-to-end **RAG** project on GPU as well as on CPU, utilizing **LangChain**, **Groq API**, and **open-source models** and **OLLAMA**.
- Developed a PDF Summarizer with LangChain and Django, including relevant notes for the LLM community.
- Developed a LLM project for **generating storybooks**, incorporating various **Crew Ai Agents**, **LangChain tools**, **Groq API**, and the **Stable Diffusion model**.
- Created an SQL Database data Extractor project using LLM and LangChain.
- Developed an end to end **Text-to-Speech project** integrating LangChain and open-source LLM models.
- Developed a **multiple-choice question generator** project based on **uploaded PDFs**.
- Conducted research and established a free open-source LLM repository, covering LLM implementation, mathematics, and relevant notes.

Development of an Entire School Management Application with Fully AI-Powered Features:

Developed an AI-powered School Management System, EduSync, integrating AI and Web Technologies with features including:

- Facial Recognition Attendance – Automates attendance tracking with manual edit options.
- Plagiarism Detection – Ensures academic integrity using NLP models.
- Automated Slide Generation – Converts lecture content into PowerPoint slides.
- MCQ Generation & Examinations – AI-generated multiple-choice questions for assessments.
- Chatbot Assistance – Provides real-time support for students and teachers.
- AI-Powered Study Tools – Summarizes lecture notes and facilitates interactive notebook querying with Agentic Rags.
- Assignment Management – Streamlines assignment creation, submission, and evaluation.
- Resource Sharing & Collaboration – Enables seamless distribution of study materials.

Development of a Nepali Image Captioning Model with Vision Transformers & GPT Architecture:

Developed a Nepali Image Captioning Model leveraging Vision Transformers and GPT Architecture to generate accurate and context-aware captions for Nepali images. The system integrates advanced deep learning techniques, including self-attention mechanisms for visual feature extraction and transformer-based language modeling for text generation. Utilizing a curated dataset of Nepali images and captions, it enhances linguistic and contextual understanding, supporting applications in accessibility, digital archiving, and automated content generation.

Development of Language Translation System using Transformers:

Developed a Language Translation System using Transformers, implementing a full encoder-decoder architecture with all attention mechanisms from scratch in PyTorch. The system ensures accurate and context-aware translations by leveraging self-attention and cross-attention for optimal linguistic representation.

Name Entity Recognition System using BERT Variants:

Developed a Name Entity Recognition (NER) System using BERT Variants, implementing a robust architecture that leverages pre-trained transformer models for precise entity classification. The system ensures accurate identification of named entities in diverse text by utilizing BERT's attention mechanisms, offering context-sensitive and high-performance results in real-world applications.

Development of AI Enhanced Smart Parking Management System (Integration of Object Detection + IOT + Cloud Computing):

Developed an AI-enhanced Smart Parking Management System by seamlessly integrating Object Detection, IoT technology, and Cloud Computing infrastructure. This innovative solution optimizes parking space utilization and enhances user experience in real-time. The system employs cutting-edge sensors and Object Detection deep learning models to track the real-time availability of parking slots. Users can interact and park their vehicles according to the guidance provided by the Object Detection system.

News Category Prediction Web Application (A Machine Learning: Classification Project) :

Created a Machine Learning-based news classification project focusing on predicting Setopati website news categories. Developed a comprehensive Web Application that accurately categorizes news articles.

Laptop Price Prediction Web Application (A Machine Learning: Regression Project):

Developed a regression-based laptop price prediction system using comprehensive dataset, advanced data processing, and EDA. Enhanced accuracy through feature engineering, trained and fine-tuned model using scikit-learn. Created user-friendly web app with Streamlit for seamless model integration, offering innovative laptop price forecasting solution.

Development of Next Word Suggestion From Scratch using RNN and Deep LSTM:

Developed an advanced next word suggestion system by implementing Recurrent Neural Networks (RNN) and Long Short-Term Memory (LSTM) architectures. Applying natural language processing techniques to large text data, enabling accurate prediction of the next word based on the given context. Integrating the intelligent system into applications like writing assistants, predictive text, conversational AI, search engines, and query auto-completion to provide intuitive next word suggestions, enhancing productivity and user experience.

Performed Vehicle Collision Dataset Analysis: Seattle Department of Transportation (SDOT):

Performed an in-depth data analysis on the Vehicle Collision Dataset from the Seattle Department of Transportation to uncover patterns and factors contributing to collisions in Seattle. Explored the frequency, severity, and distribution of collisions, identifying areas of concern and opportunities for improving road safety measures. The data-driven analysis aims to contribute towards policies and initiatives that prioritize road safety for the community.

Web Scraping (Worldometer page) : Extracting, Storing, Data Cleaning and Visualizing The Population Statistics and Storing Data in MySQL DataBase using Python:

This project employed BeautifulSoup in Python for web scraping to extract population statistics from the worldometer website. The extracted data was filtered and exported into a CSV file, which was then transformed into a DataFrame using the Pandas library for data cleaning. Matplotlib and Plotly were used to create visualizations of the cleaned data. Data from the DataFrame was stored in a MySQL database, with Python facilitating the transfer of data into the database.

Database Full Schema Design and Implementation In Oracle Database for Ecommerce Platform:

This project entailed designing and implementing a database schema in Oracle Database for an e-commerce platform. It started with creating a conceptual data model to capture business rules and entity relationships, followed by designing a logical schema for optimal data integrity and retrieval efficiency. Using Oracle Database, the schema was implemented with essential tables, columns, constraints, and relationships. Customized database queries and reports were developed to support business operations and decision-making.

Development of Fully Mobile & Desktop Application for Transaction Management using .NET Blazor Frameworks:

Developed Full Stack Java JEE-Powered, Fully Responsive E-Commerce Platform for Selling Mobile Devices:

Development Of BANKCARDS (Debit and Credit Card Fully Functionality) In Java Object Oriented Programming:

Experienced with software engineering principles, including design patterns, development methodologies, and best practices.

Certifications :

- **Artificial Intelligence Training**
Broadway Infosys – 28th Dec 2023
- **Python Django Training**

- **Supervised Machine Learning: Regression and Classification**

Stanford, DeepLearning.ai, Coursera - May 2023

- **Unsupervised Learning, Recommenders, Reinforcement Learning**

Stanford, DeepLearning.ai, Coursera - June 2023

- **Advanced Learning Algorithms**

Stanford, DeepLearning.ai, Coursera - June 2023

- **Crash Course on Python**

Google - March 2023

- **Python for Data Science, AI & Development**

IBM - March 2023

- **Object Oriented Programming in Java**

Coursera - April 2023

- **AWS Academy Graduate - AWS Academy Cloud Foundations**

Amazon Web Services - November 2023

- **AWS Academy Graduate - AWS Academy Data Engineering**

Amazon Web Services - November 2023

- **AWS Academy Graduate - AWS Academy Machine Learning for Natural Language Processing**

Amazon Web Services - November 2023

- **AWS Academy Graduate - AWS Academy Machine Learning Foundations**

Amazon Web Services - November 2023

Experiences :

NepaWholesale (West Palm Beach, Florida)

Machine Learning Engineer (NLP)

- Built the recommendation system application and customer profiling based on past purchase activities.
- Developed a mass email generation system with the integration of LLMs and agents for email marketing.
- Created a sales pitch for salespersons with the integration of LLMs and text-to-speech models.
- Developed a full-stack scraping application using automation software and LLMs to generate leads from Google Maps.
- Built an LLM application for scraping content from multiple websites (e.g., emails, products).
- Developed a RAG (Retrieval-Augmented Generation) application for product inventory management.
- Performed sentiment analysis on scraped lead shops using customer reviews and strategized outreach using LLMs and various tools.
- Conducted product classification using LLM tools and agents.
- Developed a routing system using the Google Maps API for locating leads, providing directions, and optimizing traffic.
- Created an application using LLMs and SQL agents for fast queries by salespersons, enabling them to access product information through natural language.

Languages :

English, Nepali, Hindi

REFERENCES :

Ayush Adhikari

**DeepMind Creations / CTO | Lead Data Scientist | Artificial Intelligence Consultant | Machine Learning
| Computer Vision**

Miraj is a disciplined, hardworking, and talented individual. I have personally guided and trained him in Artificial Intelligence. He possesses a sharp mindset for handling AI algorithms, with a deep understanding of Machine Learning algorithms as well as other Deep Learning algorithms including ANN, CNN, RNN, LSTM, GRU, Encoder-Decoder, Attention Mechanism, and Transformers. He has also worked with various Large Language Models (LLMs) such as OpenAI, Gemini, Llama, Hugging Face, and others. Miraj has a strong mathematical foundation for each Deep Learning algorithm from scratch and has experience working on computer vision projects. Additionally, he has excelled in NLP projects and has demonstrated great proficiency in both NLP and Computer Vision domains.

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Sushil Dyopala

AI Engineer | Educator | Entrepreneur

Miraj Deep Bhandari is an exceptionally talented AI professional. I was his supervisor and guided him in developing a deep understanding of mathematics, data science, machine learning algorithms, deep learning algorithms, computer vision, NLP, transformers, LLMs, LangChain, LangGraph, Agentic AI, time series analysis, and RFL and other AI Concept's with Implementations. His ability to grasp complex concepts quickly and apply them to real-world challenges sets him apart. I have seen his strong analytical thinking, problem-solving skills, and creativity firsthand. Miraj is a dedicated, hardworking, and detail-oriented individual who always strives for excellence. He consistently demonstrates leadership qualities, works well under pressure, and has the ability to bring innovative ideas to life. His drive for continuous improvement and passion for AI make him a standout talent in the field. His proficiency across various domains, coupled with his ability to adapt and excel in any task, makes him an invaluable asset to any team.

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