Er. Aayush Raj Regmi

ML Engineer

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PERSONAL INFORMATION

AI enthusiast dedicated to leveraging my technical background and enthusiasm for AI and Technology to address real-world problems and contribute to innovative solutions.

EXPERIENCE

NAXA, *Hybrid - GEO AI Researcher*

November 2023 - PRESENT

- Collaboration with a diverse team of researchers and practitioners to support the development of AI-powered solutions for geospatial data, urban planning, and disaster assessment projects.
- Worked on Solid Waste Detection Project: Identified solid waste in GeoTiff images of Janakpur.
- Implemented DEEP pipeline: Executed a comprehensive pipeline for Post Earthquake Damage Assessment in Jajarkot Drone Imagery.
- Worked on Automatic Building Segmentation: Assisted in implementing a fAIr model for automatic building segmentation tasks.

Fusemachines, *Remote - AI Fellowship*

January 2023 - December 2023

- Completed Microdegree in Machine Learning and successfully finished Microdegree in Deep Learning.
- Accomplished Microdegree Specialization in NLP (Natural Language Processing) and attained Microdegree Specialization in Computer Vision (CV).
- Gained a deeper understanding of various algorithms with their mathematical formulations.
- Worked on and completed four respective projects, each corresponding to the courses undertaken.

Otermans Institute, *London, UK (Remote) - ML Engineer*

February 2023 - June 2023

- Contributed to the Virtual Teacher project, focusing on the One Shot Talking Face implementation.
- Implemented a chatbot to enhance interactive customer experiences.
- Developed a Spam classifier to categorize Cuss words and spam messages on a real-time server, employing Transformers and ML approaches.
- Created a real-time interactive dashboard for a game (Company Product) using Plotly Dash in Python.

PROJECT EXPERIENCE

Solid Waste Detection from Drone Imagery

- Manually Annotated Waste Data: Utilized QGIS for manual annotation of waste data in drone images.
- Model Training: Employed U-net with ResNet backbone for training the solid waste detection model.
- Active Learning Approach: Implemented an active learning approach to refine and augment the training data, enhancing the model's performance.

Aerial Image Segmentation

- Implemented Various Deep Learning Architectures: VGGnet, Resnet, and U-Net, for the purpose of aerial image segmentation in Landcover Dataset.
- Detection of Features: Applied the models to detect and segment key features such as woodlands, buildings, roads, and water from aerial imagery.

Nepali Poem Generator

- Trained on Various Nepali Poems: Utilized poems from renowned Nepali poets such as Laxmi Prasad Devkota, Bhanu Bhakta Acharya, and Lekhnath Paudyal for training the poem generator.
- LSTM for Next Sequence Prediction: Implemented Long Short-Term Memory (LSTM) networks for predicting the next sequence in Nepali poems.
- Generative Transformer Implementation: Developed a Generative Transformer from scratch, incorporating both character and word tokenization techniques.
- Fine-tuning with Distillgpt2: Applied fine-tuning using the Distillgpt2 Nepali language model to enhance the generator's proficiency.

Virtual Fitness Coach

- Custom Exercise Tracking and Detection: Implemented a virtual fitness coach with custom exercise tracking and detection capabilities. Key points extracted from Google's Mediapipe Library were utilized, and the model was further trained using Convolutional Neural Network (CNN) architectures.
- Personalized Diet Recommendations: Based on calorific values and individual user data, provided personalized diet recommendations to users.
    - Leveraged Food Nutrient Content Data: Utilized data on food nutrient content.
    - Unsupervised Learning (Clustering): Applied machine learning approaches, specifically clustering, for unsupervised learning on food's nutritional content.

Real-Time Chat Spam Detection

- To maintain the integrity of communication platforms employed nltk library to preprocess textual information
- Initially, the Implementation of Naive Bayesian methods to classify messages
- Used Transformer architecture BERT along with Neural networks for Spam Classification

Contextual Semantic Recommendation System

- Utilized Word2Vec embedding mechanism to represent words in a meaningful vector space, capturing semantic relationships.
- Integrated ChromaDB as a vector database for storing and managing vector information directly.
- Leveraged semantic similarity measures to recommend content that aligns with the contextual semantics of user preferences.

Movies and Book Recommendation System

- Content-Based Recommendation System using TF-IDF
- Utilized TF-IDF (Term Frequency-Inverse Document Frequency) mechanisms for content representation, capturing the importance of terms within the corpus.
- Implemented cosine similarity to measure the similarity between the TF-IDF representations of movies and books.

SKILLS

Machine Learning and Deep Learning

Computer Vision and Natural Language Processing

Machine Learning Libraries: Tensorflow, Scikit Learn, Keras, Pytorch

Data Libraries: NumPy, Pandas, Seaborn, Matplotlib, Plotly Dash

Python Frameworks: FastAPI, Flask, Django

Version Control: Git and GitHub

Cloud Deployment: AWS (EC2, Sagemaker, S3)

Containerization: Docker

Database: MySQL and MongoDB

Programming Languages: Python, JS

GIS Tools: QGIS

AWARDS AND CERTIFICATIONS

Nepal Engineering Council Member

Highest CGPA in ***Bachelor of Engineering in Information Technology*** **2018 Batch:** Pokhara University

Stanford Online Machine Learning(60hrs) - *Andrew N.G.*

Micro degree in Machine Learning(3 months) - Fusemachines

Micro degree in Deep Learning(3 months) - Fusemachines

Micro degree Specialization in Computer Vision(3 months)- Fusemachines

Micro degree Specialization in Natural Language Processing - Fusemachines

Generative AI with Large Language Models(16 hrs) - DeepLearning.AI

Neural Networks and Deep Learning(24 hrs) - DeepLearning.AI

Supervised Machine Learning: Regression and Classification(33 hrs) - DeepLearning.AI

AWS Academy Graduate(20 hrs) **-** AWS Academy Machine Learning Foundations

AWS Academy Graduate(40 hrs) **-** AWS Academy Cloud Architecting

AWS Academy Graduate(20 hrs) **-** AWS Academy Cloud Foundations

Programming Foundations with JavaScript, HTML and CSS(33 hrs) - Duke University

Web Application Technologies and Django(15 hrs) - University of Michigan

Interactivity with JavaScript(9hrs) - University of Michigan

Python Data Structures(19 hrs) - University of Michigan

Programming for Everybody (Getting Started with Python)(19 hrs) - University of Michigan

Front-End Web UI Frameworks and Tools: Bootstrap 4(30 hrs) - The Hongkong University of Science and Technology

Introduction to HTML5(11 hrs) - University of Michigan

Google Ads for Beginners(2 hrs) - Coursera Project Network

EDUCATION

Nepal College of Information Technology, *Balkumari, Lalitpur - Bachelor of Engineering in Information Technology*

2023

CGPA: 3.9 / 4

Kathmandu Model College, *Bagbazar - +2 Science (Bio)*

2018

Budhanilkantha School, *- SLC*

2016

REFERENCES

Rishi K. Marseni - Asst. Professor, Ph.D. Scholar

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