Ambar Chakraborty

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TECHNICAL SKILLS

Languages: Python, Javascript, R, SQL, C, C++, BASH, MIPS, HTML, CSS
Libraries: Python – Keras, Django, Flask, Pandas, Numpy, Pytorch, Scikit-Learn, Matplotlib, Tensorflow, Dash
Javascript – React, MongoDB, TensorflowJS, Mediapipe, Material-UI
Tools: Git, Jira, Confluence, Tableau, Power BI

WORK EXPERIENCE

Deep Learning Engineer Intern| Tensorflow, Dask, Xarray, BASH **Ottawa, Ontario**
Environment & Climate Change Canada Jan 2024 – Present

- Developed a Sea Ice forecasting system using an ensemble **Convolutional Neural Network** architecture, producing sea ice concentration forecasts up to 6 months in advance using satellite images
- Automated periodic download, preprocessing and input of observational satellite data into prediction model, allowing forecasts to be produced at scheduled time intervals

Data Analyst Intern| Pytorch, Keras, Dash, React, MongoDB **Vaughan, Ontario**
Martinrea International Inc May 2023 – Aug 2023

- Built a machine health monitoring system using **LSTM Variational Autoencoder Neural Networks**, using data from over 100 sensors, capable of **predicting** machine breakdowns weeks in advance
- Developed an **Extract Transform Load (ETL)** pipeline connecting three different sources of data, allowing more information to be used to make more precise statistical analysis
- Utilized **React** to develop a **web application** which provides real time alerts and visualize live machine data, allowing control engineers to respond promptly to potential machine failure
- Developed **backend of a data analysis software** capable of visualizing and summarizing machine health data based on user provided inputs
- Performed **Exploratory Data Analysis** on **time-series** data to recognize machine failure patterns, and used statistical tests such as **ANOVA test** and **moving averages** to detect machine fatigue and imbalance

Market Data Analyst Intern| Python, SQL, Tableau **Mississauga, Ontario**
Independent Electricity System Operator (IESO) Sep 2022 – Dec 2022

- Built pipeline **connecting database to Excel** to schedule and automate daily report generation, saving 30 minutes of work daily
- Prepared data for running simulations to investigate potential market protocol violations and **predict market outcomes** under various constraints
- Developed a **population-weighted temperature metric** to improve accuracy of electricity demand forecast
- Revamped weekly reports by creating **new graphs in Tableau** to visualize and gain insight from **previously unused data**, and improve conciseness

PROJECTS

Better Call Paul

- Built a **personal AI lawyer** chatbot, with backend built using **Flask**, capable of providing legal advice, explaining laws and build defense strategy, trained on documents of provincial and federal laws
- Used Open AI **GPT-4 LLM** to train the model and **Langchain** to build pipeline between dataset and servers

Real Time Sign Language Detection

- Developed a web application utilizing **React** which generates text from hand signs captured from live webcam video, using **Mediapipe** to detect the palm and draw a box around it
- Trained a custom multi-classification CNN sign language detector capable of processing 60 FPS video

Customer App Feedback Analysis

- Created **semantic embeddings** in **NLTK** to **cluster** customer reviews, allowing identification of topics mentioned most frequently, and used **sentimental analysis** to recognize topics with mostly negative reviews
- Used **few-shot prompting** with Mixtral-8x7B LLM to generate comments which correspond to the most mentioned topics, to augment dataset of relevant comments
- Filtered out reviews which don't correspond to any of the topics using cosine similarity of word embeddings

EDUCATION

Bachelor of Mathematics (Honors), 2026, University of Waterloo
Double Major - ***Statistics and Computational Mathematics***
Cumulative Percentage Score – 85.5 % (Dean's Honors List 4 X)