Himalaya Sharma

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Education

- **University of Waterloo** — Waterloo, Canada
  Master of Engineering - Electrical & Computer Engineering; Percentage - 87.6% — *Jan 2022 - Present*
  Relevant Coursework: *Deep Learning, Machine Learning, Statistics for Data Analysis*

- **Birla Institute of Technology & Science** — Goa, India
  Bachelor of Engineering - Electronics & Communication Engineering; GPA - 8.30/10 — *Aug 2016 - May 2021*
  Master of Science - Biological Sciences; CGPA - 8.30/10
  Relevant Coursework: *Linear Algebra, Calculus, Probability & Statistics, Digital Signal Processing, Introduction to Bioinformatics*

Experience

- **Vienna University of Technology & New York University, Abu Dhabi**
  Research Internship (CARE-Tech. group) | Advisor - Prof. Dr.-Ing Muhammad Shafique — *August, 2020 - May, 2021*
  Machine Learning for wearable healthcare
  - Investigated and optimized the Temporal Fusion Transformer, a state of the art multi-horizon time series forecasting deep learning model, for bio-signals (primarily ECG).
  - Integrated data generators in the workflow to handle large datasets and analyzed forecasts made by 100+ variants of above mentioned model, for pre-emptive heart diagnosis.
  - Evaluated performance of model variants using visual plots and added 3 forecast KPIs (key performance indicators) namely - MAPE, MSE and MAE.
  - Experimented with modified loss functions to enhance forecast capability of TFT.

Projects

- **Reverse Image Search Engine:** Gives top 5 matches for input query image [Github]
  - Constructed **content-based image retrieval** system using **VGG-16 deep learning model** and **CIFAR-10** dataset.
  - Trained model (initialized with **ImageNet weights**) for **multi-class classification** and obtained **accuracy** of **89%** on **stratified validation set** and **90%** on **test set**.
  - Utilized network front-end for **feature extraction** and generated **60k** image encodings to compute similarity scores against query image for obtaining **top 5 matches**.

  Tech Stack: *Python, TensorFlow*

- **Jarvis Lite:** AI-powered virtual assistant [Github]
  - Recorded **4-second monophonic audio clips (16 kHz)** contaning questions in **wav format** and employed **AssemblyAI's API to generate corresponding speech to text transcripts**.
  - Utilized **OpenAI's API** with a **GPT-3 backend (Davinci variant)** to **produce answers capped at 100 tokens**.

  Tech Stack: *Python, AssemblyAI API, OpenAI API*

- **Elementary Blockchain:** Deployed **web application** to exhibit features of blockchain. [Web App] [Github]
  - Employed an **object-oriented approach** to implement a **blockchain model**.
  - Built functionalities to - **view** chain, **mine blocks** (using a simple **proof of work algorithm**), evaluate **validity** and facilitate **tracaebility** of any **illegal modification**.

  Tech Stack: *Python, Flask, HTML, CSS, Heroku*

- **Sensor Data Compression:** Exploration of compression using **dimensionality reduction** [Video] [Github]
  - Employed **6 feature extraction** and **3 feature selection** techniques on **wearable physiological sensor data**.
  - Evaluated classification performance on reduced data using **KNN, Decision trees, SVC & Random Forest**.
  - Achieved **maximum compression** of upto **99.25%** with an **accuracy percentage loss** of only **6.7%**.

  Tech Stack: *Python, Scikit-learn*

Certifications

- **Certified TensorFlow Developer**, by **TensorFlow** | Issued: **27 Aug'22** & Expiry: **27 Aug'25**
- **Certified Cloud Practitioner**, by **Amazon Web Services (AWS)** | Issued: **17 Aug'22** & Expiry: **17 Aug'25**
- TensorFlow Developer Specialization, by Coursera | Issued: Aug'22
- Building Transformer-Based Natural Language Processing Applications, by NVIDIA DLI | Issued: Jul'21
- Fundamentals of Deep Learning, by NVIDIA DLI | Issued: Jul'21
- Deep Learning Specialization, by Coursera | Issued: Aug'20
- Python, by HackerRank | Issued: Jun'20

Skills Summary

- **Languages & Tools**: Python, R, SQL, Git
- **Frameworks & Packages**: Scikit-Learn, TensorFlow, Keras, NumPy, SciPy, Pandas, Matplotlib
- **Data Science & Machine Learning**: Data Collation & Wrangling, Statistical Analysis, Model Development & Enhancement, Visualization & Interpretation, Clustering, Classification, Regression