Himalaya Sharma

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Education

- **University of Waterloo** — Waterloo, Canada
  Master of Engineering - Electrical & Computer Engineering (Specialization: AI & ML) — *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 — *Aug 2016 - May 2021*
  Master of Science - Biological Sciences
  Relevant Coursework: *Linear Algebra, Calculus, Probability & Statistics, Digital Signal Processing, Introduction to Bioinformatics*

Experience

- **University of Waterloo**
  Graduate Research Assistant | Advisor - Prof. Zhou Wang — *Sep, 2022 - Present*
  - Benchmarked **5+ Blind Image Quality Assessment (BIQA)** deep learning models on **10+ synthetic** & **authentic distortion** image databases.
  - Wrote and deployed batch jobs for training and testing models on **High Performance Compute** clusters - **Graham** (University of Waterloo) and **Cedar** (Simon Fraser University).
  - Submitted co-authored paper with obtained image quality metrics to **IEEE Transactions on Image Processing (TIP)**.
- **Ubiquitous Health Technology Lab - University of Waterloo**
  Data Science Intern | Advisor - Prof. Plinio Morita — *Sep, 2022 - Present*
  - Performed **Human Activity Recognition (HAR)** for **20+ scenarios** leveraging **in-house** environmental & wearable sensor data collected from **40+ participants**.
  - Constructed a robust pipeline for data loading, cleaning & 2-stage transformation composed of **windowing** and **statistical feature extraction**.
  - Employed **classical** and **sequential deep learning** classification models for activity recognition.
- **Vienna University of Technology & New York University, Abu Dhabi**
  Machine Learning Research Intern | Advisor - Prof. Dr.-Ing Muhammad Shafique — *August, 2020 - May, 2021*
  - Explored applicability of statistical and machine learning based time-series models for **pre-emptive arrhythmia detection** using ECG (electrocardiogram) data.
  - Experimented extensively with **Temporal Fusion Transformer (TFT)**, an attention based deep learning forecasting model with variable length multi-step forecast windows.
  - Integrated **data generators** in the workflow to handle large datasets and experimented with **modified loss functions** to enhance forecast capability.
  - Evaluated forecast performance of **100+ model variants** using visual plots and 3 forecast KPIs - MAPE, MSE and MAE.

Projects

- **Reverse Image Search Engine:** Small-scale clone of Google's search by image [Github]
  Utilized VGG-16 (deep learning model) 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:** Small-scale clone of Iron Man's virtual assistant Jarvis [Github]
  Recorded monophonic audio clips containing questions and employed AssemblyAI's API to generate speech to text transcripts. Utilized OpenAI's API with a GPT-3 backend to produce answers to those questions.
  Tech Stack: *Python, AssemblyAI API, OpenAI API*

- **Elementary Blockchain:** Web application to showcase features of blockchain [Web App] [Github]
  Employed an object-oriented approach to implement a blockchain model with 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. 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**

Skills Summary

- **Tools & Technologies**: Python, R, SQL, Scikit-Learn, TensorFlow, Keras, NumPy, SciPy, Pandas, Matplotlib, Git, AWS
- **Data Science & Machine Learning**: Data Collation & Wrangling, Statistical Analysis, Model Development & Enhancement, Visualization & Interpretation, Clustering, Classification, Regression, Natural Language Processing, Computer Vision