NILESH FONSEKA

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Experience

Junior Machine Learning Engineer   **Jan 2025 – Present**
Engenia Solutions Pty. Ltd - *Victoria, Australia (Remote)*

Binary classification to identify Frogs & Non-Frogs sounds:
- Transformed WAV audio files from both classes into embeddings, preparing training, testing, and validation sets.
- Applied cross-validation techniques to divide classes into these sets and performed embedding and training using the pre-trained model **YAMNET** from **TensorFlow.**

Employee Management system development:
- Developed the backend using **Django** and the frontend using **ReactJS**.
- Efficiently handled API requests using **Django Rest Framework** and managed **CORS** for connecting the ReactJS frontend
- Utilized **axios** and **state variables** in the React frontend for backend communication

Joint probability calculation of weather factors:
- Developed a method using **Discrete Bayesian networks** to calculate the joint probability of three weather factors Temperature, humidity, wind – each with dependencies on the others.

Backend API development for ML prediction application:
- Implemented a **Fast API** backend to efficiently handle API requests and responses.

Machine Learning Engineer - Intern   **July 2024 – Jan 2025**
Engenia Solutions Pty. Ltd - *Victoria, Australia (Remote)*

Extraction & analysis of Australian women's sports news:
- Conducted web scraping using **Selenium** for Australian women's sports websites and built a classification pipeline to categorize the extracted news as on-field and off-field using **OpenAI LLM's**.
- A sentiment analysis was then performed using **Hugging face BERT** and statistical tests like **Chi-square, ANOVA** was conducted to analyze relationships between performance-related and social well-being news.

Active frame counting on brood boxes to identify bee harvest:
- Developed an object detection model using **YOLO, Fast RCNN** to identify the number of active frames inside a brood box via thermal images.
- Initially the bounding boxes were annotated for the dataset and trained on COCO-formatted data. After hyperparameter tuning and reducing the model complexity, the accuracy of the model increased from 68% to 75%.

Audio Classification for multiclass bird species:
- Built a multiclass classification model using **TensorFlow Keras**.
- Applied data augmentation (noise addition, pitch shifting) and regularization techniques (Ridge L2, dropout) to improve generalization. Deployed a **Flask-based web app** for real-time predictions.

Power BI Dashboard Development:
- Designed interactive dashboards for grant distribution analysis across Australian universities using DAX and Power Query, optimizing data processing for efficient insights

Data Analytics Intern   **Feb 2024 – June 2024**
Dialog Network Services (PVT) Ltd

Power BI Dashboard Development & Automating workflows
- Developed and optimized interactive dashboards for Site Acquisition data visualization using **DAX and Power Query**.
- Streamlined and automated Site Acquisition processes using Workhub24, enhancing operational efficiency.

Research

Quantum–inspired methods for training machine learning models
- Developed a Quadratic Unconstrained Binary Optimization (QUBO) algorithm to enhance multiple regression modeling & utilized D-Wave Quantum Computers to explore quantum speedup potential.
- This research is in the process of submission for Modern Education and Computer Science Press journal

Education

BSc (Hons) in Computational Mathematics
(Computer Science & Applied Mathematics)
University of Colombo - Faculty of Science | GPA - 3.178
Certificate in Business Administration
Wisdom Business Academy
St. Peter's College - Colombo 04
GCE A/L's – Combined Maths (A), Physics(C), Chemistry (C)
GCE O/L's – 9 A's

Skills

Languages & Frameworks: Python, R, SQL, Flask, Django, Langchain
Machine Learning & Deep Learning : NumPy, Pandas, Matplotlib, Seaborn, Scikit Learn, TensorFlow, PyTorch, YOLO, Hugging Face, NLP, LLM
Web Development : HTML, CSS, JavaScript, ReactJS
Miscellaneous : Selenium, AWS Services (S3, EC2, EBS) , Docker , GitHub Actions , OOP concepts, Fast API, CI/CD, JIRA & Confluence, Power BI (DAX, Power Query)