

Aishwarya Mala GM

I am a Machine Learning Engineer that wants to leverage the power of Artificial Intelligence to build applications that will help the organization achieve its goal and at the same time pave a path to a futuristic society with improved quality of life.

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Canada

WORK EXPERIENCE

Machine Learning (ML) Engineer

Contact: gopeekrishnan.g@tcs.com

Tata Consultancy Services (TCS) 02/2022-01/2023 & 06/2017- 07/2019, Bengaluru, India

jerric.paul@tcs.com

Skills Used: Python, Git, Docker, Kubeflow (Kubernetes), MongoDB, Amazon S3, SQL, NLTK, Clustering (K-means, HDBSCAN), Language Models (LLMs), Time series forecasting (XGBoost, DeepAR), Anomaly Detection, Agile Software Development Methodology.

- Our team worked on designing, developing, and deploying Python based (CI/CD) machine learning pipelines for Natural language processing (NLP) and Time series analysis.
- Improved the performance of our customer's internal query channel (Rasa) chatbots by integrating a Haystack based closed domain Q&A component into it.
- Converted the LLMs used for embedding in all our NLP pipelines to ONNX format to decrease runtime and model size.
- Contributed to the development of an NLP based pipeline that identifies the emerging trends in our customer's incoming tickets dataset to identify the issues with rising recurrences in order to analyse and resolve them at early stages.
- Analysed and improved the time series forecasting and anomaly detection ML pipelines based on Xgboost and DeepAR models.

Deep Learning Intern

Thirona 08/2021 - 11/2021, Nijmegen, Netherlands

Contact: jonneengelberts@thirona.eu

Skills Used: Deep Learning, Medical Image Analysis, Image Segmentation, U-Nets, Keras (TensorFlow), Retinal Fundus Images.

- Successfully developed a Keras-based deep learning model that can segment out the retinal vasculature from the fundus image of the eye.
- Leveraged transfer learning to build a classification model on top of the segmentation model to categorize the segmented blood vessel pixels into arteries and veins.

Teaching Assistant

University of Twente 09/2020 - 11/2020, Enschede, Netherlands

Skills Used: Python, Jupyter Notebooks, Scikit-Learn (sklearn), Pandas, NumPy, SciPy, Bayesian Classifiers, Regression Models, Support Vector Machines, Neural Networks, Decision Trees and Random Forest, Dimensionality Reduction (PCA).

- Teaching Assistant for [Basic Machine Learning](#) course.
- Coordinated lab sessions for students, graded, and provided feedback on all student assignments and exams, and helped students understand the course material better.

EDUCATION

Master of Science, Computer Vision and Biometrics, University of Twente

09/2019 - 11/2021, Enschede, Netherlands

Bachelor of Technology, Electronics and Communication, Amrita School of Engineering

08/2013 - 05/2017, Coimbatore, India

CERTIFICATIONS

Data Visualization Developer Certification, Online certification, Free Code Camp

05/2023

Skills Used: Data Visualization, D3.js, HTML.

[Link to the certificate](#)

Data Analysis with Python Certification, Online certification, Free Code Camp

06/2023

Skills Used: Data Analytics, Pandas, NumPy, SciPy, Matplotlib, Seaborn.

[Link to the certificate](#)

ACADEMIC PROJECTS

Master Thesis: Invertible Recurrent Inference Machine (iRIM) for low-dose CT reconstruction

Skills Used: Computed Tomography (CT), PyTorch, Deep Learning, Medical Image Analysis, iRIM, RNN.

Following its success in undersampled MRI reconstruction, an iRIM model was modified and trained for low-dose CT reconstruction. The model recorded great performance and is currently ranked second in the [LoDoPaB CT Challenge](#).

Master Internship: Blood Vessel Segmentation from Retinal Fundus Images

Skills Used: Deep Learning, Medical Image Analysis, U-Nets, Keras, Image Segmentation, Retinal Fundus Images

Developed a U-Net with added boundary enhancement and feature denoising modules to segment out the retinal vasculature from its fundus image. Built a classification model on top to classify the segmented pixels into arteries and veins.

Anti-spoofing algorithm for face recognition systems based on pupil response

Skills Used: MATLAB, Fast Radial Transform, Pupil Detection, Liveness Detection.

This project aimed at using image processing algorithms to calculate the area of the pupils in the input images captured in different light settings. These pupil areas are analysed to detect the liveliness of the subject during face recognition.

Atrial Fibrillation (AF) episode Detection from ECG signals

Skills Used: Dimensionality Reduction, Neural Networks, Support Vector Machines, Decision Trees.

AF is a heart condition caused due to irregularity in the beating of the atrial chambers. An AF episode detection model was trained on a dataset that was created using the R-R interval lengths extracted from the ECG signals of the patients.

Ghost fingerprint Detection

Skills Used: MATLAB, Neural Networks, K-nearest neighbours, Random Forest, Local Frequency and Orientation Estimation, Fast Fourier Transform.

Fingerprint images collected might be corrupted by remnants from the previous fingerprints. These are termed ghost fingerprints. The input image is divided into blocks and features based on the local orientation, frequency and mean pixel intensity were extracted from it. Classification models were trained on the features extracted to detect the presence of ghost prints in the input.

Gender Detection through Speech Processing

Skills Used: Neural Networks, Support Vector Machines, Gaussian Mixture Models.

The acoustic features of an input speech signal were extracted using the MFCC algorithm. The extracted 12 MFCC coefficients were used as features to train machine learning models to detect the gender of the speaker.

Text Summarization

Skills Used: Extractive Summarization, Word2vec, Logistic Regression

The aim is to create a summary of the input text by identifying the most relevant information. A logistic regression model was trained to score each sentence based on features like the similarity between the Word2vec model vectors of the sentence and the input text, its length and position in the input text. The top scored sentences were then used to create the summary.

Man Overboard

Skills Used: MATLAB, Optic Flow Motion model, Object Tracking, Distance Estimation.

The Man Overboard project, designed to help rescue missions, aims to track a test buoy in a video of it floating on rough waters given its initial position and then estimate its distance from the camera in meters.

PUBLICATIONS

Bachelor Thesis: Computer aided system for Detection and Classification of Brinjal Leaf diseases using thermal and visible light images.

Skills Used: MATLAB, Infrared or Thermal Imaging, Image Registration, Feature Extraction, Neural Networks, Support Vector Machines.

Thermal images have a fine potential for early detection of leaf diseases as these diseases cause changes in transpiration rate that result in temperature variations. Therefore, an attempt is made to combine the analysis of visible light and thermal image features for early and accurate disease detection in brinjal leaves.

[Link to the publication](#)

VOLUNTEERING

- Active participant and organizer in TCS Purpose4Life initiative. I have volunteered to social and environmental events like beach cleaning, tree planting and visiting schools in rural areas for mentoring and study material distribution sessions for students in need.
- A part of the team formed by the Department of Social Works (Amrita University, India) to helped spread awareness on the hazards of improper medical waste disposal and helped local clinics in the Coimbatore and Madurai area build simple waste disposal solutions.