SHRIRAM PIRAMANAYAGAM

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# EDUCATION

**The University of Edinburgh**Edinburgh, UK

*Master of Science in Computer Science*September 2023 - August 2024Coursework: Advanced database systems, Applied Cloud Programming, Software development, Accelerated Natural Language Processing, Machine Learning Practical, Case studies in Design Informatics

**College of Engineering Guindy, Anna University**Chennai, India

*Bachelor of Engineering in Electrical and Electronics*August 2015 - April 2019Coursework: Engineering Mathematics, Transform Techniques and Partial Differential Equations, Numerical Methods, Computing Techniques, Data Structures and Algorithms, Fundamentals of Computer Architecture, Operating Systems

# EXPERIENCE

## Senior Software EngineerChennai, India *Predigle*August 2022 - August 2023

* Developed a market intelligence platform using Angular, Django, Postgres, MongoDB, and Kafka.
* Involved in the complete development lifecycle, which includes brainstorming, data modelling, API implementation, UI development and Kafka data pipeline creation.
* Designed algorithms for the calculation of various business metrics. Developed a novel simulation algorithm using KDE.

## Test EngineerBangalore, India *Siemens*July 2019 - August 2022

* Perform hardware and software tests for a web-based distributed process control system.
* Worked on industrial communication protocols and mathematical models of industrial machines, controllers, valves, and actuators.
* Worked on continuous, sequential, and event-driven architectures in the design and operation of the system.

# TECHNICAL SKILLS

**Programming Languages and Packages**: Java, Spring boot, Python, Django, Kafka, GCP, Docker, JavaScript, React, Angular PyTorch, TensorFlow, SpaCy, Scikit-learn

**Application Software**: MATLAB, Tensorboard, Arduino, Figma

# PROJECTS

## Sports Analysis, Insights and Recommendation System *The University of Edinburgh*

Contributed to the overall development of a football analytics application to track players and team statistics through sensor data and schedule physiotherapy and training for players with the help of machine learning. Django, Kafka, Pytorch, Gitlab CI/CD, Postman and Vuejs were the technologies used for the project.

## Caching Large Language Model Requests with Dynamic Request Streams *The University of Edinburgh* Implemented various online Active Learning (AL) approaches for caching requests to large language models, assess the performance with dynamic request streams and ultimately reduced expensive API calls to a Large Language Model (LLM) for handling user queries.

## Backend development using Java *The University of Edinburgh*

Designed and developed a backend system using Java Spring boot for API and Kafka for asynchronous processing and hosted the dockerized application to Azure cloud.

## Lightweight database management system *The University of Edinburgh*

Implemented a lightweight database management system from scratch that can execute SQL queries by translating it to relational algebra query plans followed by iterative evaluation and optimized execution.

## Machine learning *The University of Edinburgh*

* **Advancing Lung Disease Detection in Chest X-rays through Zero-Shot Learning** – Improved the quality and accuracy of disease localization in chest x-rays through a zero-shot pipeline consisting of Segment Anything Model (SAM) for object detection and MedCLIP, a medical image-text multi modal model for disease classification and achieved ~9% increase in mean average precision over previous zero-shot methods.
* **Training deep convolutional neural networks** – Analyse the challenges in training deep neural networks and implemented batch normalization and residual connections from scratch in a deep VGG network.
* **Comparative study of regularisation in large neural networks** – Implemented a modular neural network library from scratch and compared the performance of various regularisation methods such as Dropout, L1, L2 in large neural networks using EMNIST dataset.

## Natural Language Processing *The University of Edinburgh*

* **Curriculum learning for Neural Machine Translation** – Conducted a review on the current state-of-the-art curriculum learning methods for machine translation tasks by analysing 40+ research papers and wrote a research review paper consolidating the findings.
* **Task-oriented dialogue system** –Implemented slot labelling of a task-oriented dialogue system using Logistic Regression using BIO slot labels. Analysed the model performance and performed feature engineering using linguistic features to improve model performance.
* **N gram language model** –A trigram character level language model was developed for English, Spanish, and German text and various smoothing methods were compared to reduce perplexity. Grid search was used to find optimal hyper-parameters.

## Clustering algorithm using K-Mode *Predigle*

Implemented a customer clustering algorithm using K-Mode, with data from multiple data sources processed to select suitable features after vectorizing unstructured data formats, to generate data segments and automate business insights.

## Sequence models *Coursera*

* **Neural Machine Translation** –Implemented an attention model to translate human-readable dates to machine format.
* **Named Entity Recognition** – Trained a transformer model to extract and classify important information from a large corpus.

## Computer Vision

* **Face recognition** – Implemented and trained a FaceNet architecture with a triplet loss function to perform face verification and recognition.

## Pedestrian Speed Estimation *Siemens*

Designed a custom-trained YOLO model for pedestrian tracking with deep sort for object reidentification and implemented 2D planar transformation for estimating speed by calculating homography matrix using SVD.

## Focused Twitter

Developed a mobile application where users can create custom queries with a combination of conditions and receive only matching tweets for a distraction-free Twitter experience.

# CERTIFICATIONS

## Deep Learning Specialisation *Coursera* October 2022 - March 2023

**Coursework**: Neural Networks and Deep Learning, Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization, Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models

# VOLUNTEERING

* Volunteer for National Service Scheme that delivers community service such as rural area camps and educational support camps for homes with specially-abled children. Additionally, I volunteered for teaching classes, cleanup drives, surveys, awareness programs and social events.
* Involved in CSR activities by Siemens that involved conducting and participating in blood donation camps and awareness runs.
* Volunteered for food and medicine distributions across the city during emergencies such as floods and Covid outbreak.

# LANGUAGES

* English (CEFR C1 – IELTS band 7.5)
* Hindi
* Tamil

# VISA STATUS

# Currently on a student visa with eligibility for a two-year PSW Visa post-course completion.