

# Vijay Murugan Appavu Sivaprakasam

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## EDUCATION

**Master's in Artificial Intelligence, Texas A & M University** | (3.67/4 GPA)

Aug 2025 – May 2027

**Bachelor's in Computer Science, PES University** | (8.7/10 GPA)

Aug 2019 – May 2023

## SKILLS

**Programming:** Python, Java, SQL

**Libraries:** NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow, PyTorch

**MLOps Tools:** Git, Docker, Pydantic, CI/CD Pipelines

**Databases & Frameworks:** PostgreSQL, MongoDB, DynamoDB, Oracle DB, Flask, FastAPI, Spring, Spring Boot

**Cloud Tools:** GCP, AWS, Sagemaker, S3, Lambda, CloudFormation, Cloudwatch

## EXPERIENCE

### GoTo

Jun 2023 – Aug 2025

**Software Engineer** (Machine Learning)

Bangalore, India

- Developed an unsupervised recommendation system for GoTo products using k-means clustering to group similar items and cosine-similarity matching on user interactions, driving relevant suggestions that increased new-product sales by 7%
- Predicted next-month customer churn using a logistic-regression model with recent usage level, percentage drop vs prior months, inactive days, accurately flagging at-risk customers and boosting retention among this segment by about 25%
- Engineered and deployed a payment recovery feature using Java 11 and Spring Boot to re-attempt the processing of failed transactions, increasing recovery rate by 70% and improving overall payment success metrics
- Tech Stack: Python, Fast API, Java, Spring Boot, DynamoDB, MySQL, Docker, JUnit, Jenkins, Mockito, AWS, EasyMock, pytest

### GoTo

Jan 2023 – Jun 2023

**Software Development Engineer Intern**

Bangalore, India

- Designed an address verification mechanism that reduced fraudulent activities and manual review processes by 10% while maintaining 98% accuracy, with unit and end to end integration testing with EasyMock
- Tech Stack: Java, Spring Boot, Docker, AWS, Splunk, Sumo Logic, Telemetry Kibana

## PATENTS & PUBLICATIONS

Government of India Patent Certificate - Smart Shopping Trolley - Indian Patent Number: 555691

**Automated Shopping Cart:** Reducing Long Queues One Cart at a Time - International Conference on Smart Data Intelligence

## PROJECTS

**Smart Shopping Cart** (Java, Python, ML, IoT) | [GitHub](https://github.com)

- Built an IoT based shopping cart leveraging load cells for real-time weight detection mounted with 98% precision upon calibration on a wooden plank, along with Arduino UNO with a Bluetooth sensor for transmission of weight
- Constructed a dataset for fruits and vegetables from scratch for over 30 classes consisting of over 30000+ images with various web scraping and augmentation techniques
- Made use of ensemble learning techniques with a combination of EfficientNetV2 and MobileNetV2 for real-time image classification fine-tuned to the custom dataset obtaining an accuracy of 95%+
- Developed an Android app based on Java with Firebase login and database for integration of all the components to generate a final bill with a classification feature, calculation of the current price of items cutting wait times in queues

**Adversarial Attack and Defense Analysis** (Python, Pytorch) | [GitHub](https://github.com)

- Implemented diffusion based Generative AI adversarial attacks on images and through loss function optimization by modifying cross-entropy loss to Carlini & Wagner loss, improving the attack transferability by 39%
- Researched about various image immunization techniques including [PhotoGuard](#), [AdvPaint](#), and [DiffusionGuard](#), evaluated PhotoGuard on a small subset of images, achieving a success rate of 96.67% in preventing attacks

### CLIP Model Optimization

- Optimized self-supervised CLIP training by testing against multiple optimizers including Adam, AdamP, and AdamW and various loss functions SogCLR and iSogCLR achieving best zero-shot top 1 accuracy of 24.45% using AdamW with SogCLR loss
- Added Weights & Bias for checkpoint management to reduce the training time by 87%

**Visual SketchPad Implementation and Benchmarking** (Python, Pytorch, OpenAI, Gemini, Stable Diffusion) | [GitHub](https://github.com)

- Evaluated a visual chain-of-thought framework on the Path-VQA dataset containing 6k+ pathology Q&A pairs, focusing on yes/no accuracy and qualitative reasoning quality
- Benchmarked GPT-4o, GPT-3.5-mini, Gemini-2.5-Flash, and BLIP-VQA models on medical visual reasoning, analyzing performance gaps and model strengths across tasks and reported a 10% improvement over baseline reasoning performance