Aswin Gunasekaran

Dearborn, MI | Phone: (313)-696-8022 | aswing@umich.edu | linkedin.com/in/aswingunasekaran

Education

University of Michigan - Dearborn **April 2025**
Master of Science, Data Science (GPA: 3.9/4) *Dearborn, Michigan*

Sri Ramachandra Institute of Higher Education and Research **July 2023**
Bachelor of Technology, Computer Science and Engineering (AI and ML) (GPA: 8.63/10) *Chennai, India*

Technical Skills

Programming Languages: Python, R, SQL, HTML, CSS
Data Visualization & Analytics: Microsoft Excel, Power BI, Tableau, SAP Analytics Cloud (SAC), IBM SPSS
Frameworks: Numpy, Pandas, TensorFlow, Flask, Docker, OpenCV, Unity
Version Control: GitHub
Cloud: Microsoft Azure, AWS
AI: Large Language Models (LLMs), Generative AI

Experience

University of Michigan - Dearborn **June 2025 – Present**
Research Assistant *Michigan, USA*

- Built a Unity-based multi-camera dashboard system simulating proximity alerts and lane-change scenarios with **C#** scripts and UI animation.
- Developed a video-to-motion reconstruction pipeline using **YOLOv8** and **OpenCV**, exporting overlay videos and per-vehicle CSV trajectories for **Unity** integration.
- Curated datasets including 200+ flat tire and 100 pothole images; trained ML/DL models (**Random Forest**, **MobileNetV2**, **ResNet50**, **InceptionV3**, **EfficientNetB0**), achieving up to 90% accuracy.
- Performed cross-domain validation on Kaggle, AI generated datasets and applied ensemble learning, domain adaptation, and test-time augmentation to improve model robustness.

Agape National Academy of Music **June 2025 – Present**
Grant Database Manager *Remote, USA*

- Developed and maintained data tracking tools in Excel using pivot tables, formulas, data validation, and filters, improving data accessibility and reducing manual lookup time by 50%
- Created dashboard visualizations to monitor over 40 active records, supporting real-time status reporting and deadline alerts directly enhancing operational visibility.
- Analyzed 100+ records to identify patterns and prioritize actions, that improved strategic alignment with key programs.
- Prepared detailed reports and supporting documentation to ensure 100% compliance with funder standards, reflecting strong attention to accuracy and quality control.

Sri Ramachandra Institute of Higher Education and Research **February 2023 – June 2023**
Teaching Assistant *Chennai, India*

- Assisted students in understanding Deep Learning concepts, focusing on **TensorFlow** model development.
- Supported grading of coursework and projects, providing detailed feedback to improve student understanding.
- Collaborated with faculty to facilitate academic discussions and clarify technical topics during lab sessions.

Sri Ramachandra Institute of Higher Education and Research **October 2021 – December 2021**
Machine Learning Intern *Chennai, India*

- Developed a **Twitter Sentiment Analysis** model using **NLP** techniques to analyze and categorize tweets based on sentiment.
- Conducted Exploratory Analysis (EDA) and visualized the dataset using **Matplotlib**, **Seaborn** and **Plotly** to gain insights into posting the tweets.
- Utilized word clouds to visually represent and interpret the opinions expressed in the tweets, providing a nuanced understanding of audience sentiment.

The Sparks Foundation **February 2021 – April 2021**
Data Analyst Intern *Remote, India*

- Developed a **Random Forest** model to predict student performance levels based on academic and behavioral data.
- Performed **data cleaning**, **feature engineering**, and **exploratory analysis** to improve model accuracy and interpretability.
- Delivered actionable insights through model evaluation and visualizations to help improve student productivity and academic outcomes.

Projects

Data Management System | *Flask, MySQL, Docker, PowerBI*

- Developed a RESTful API using Flask to interact with a MySQL database hosted in a Docker container.
- Enabled full CRUD operations on employee data via Postman, seamlessly syncing changes with MySQL Workbench.
- Integrated Power BI to connect to the MySQL database using ODBC for real-time visualization and analysis of employee data.
- Implemented Docker for containerization to enhance application portability and manage dependencies across environments.

Data Analysis and Statistical Modeling for CO2 Emissions Prediction | *R, Tableau*

- Conducted data analysis and visualization using R and Tableau to uncover insights from vehicle attributes and CO2 emissions data.
- Performed comprehensive data preprocessing in R, ensuring data integrity through cleaning, transforming categorical variables, and addressing multicollinearity to optimize feature selection.
- Built and validated multiple linear regression models to predict CO2 emissions, achieving a high R^2 value of 0.8975.

Hybrid ML Approach for Parkinson's Disease Detection using Vocal Biomarkers | *Python, Scikit-learn*

- Implemented a machine learning project focused on classifying Parkinson's and non-Parkinson's cases using speech datasets.
- Processed and analyzed speech data using Python and scikit-learn, implementing advanced techniques for feature extraction and dataset preprocessing.
- Developed a novel approach by collecting and storing newly generated samples from the hybrid SMOTE technique, creating a new dataset for improved model training.

Alzheimer's Dementia Classification using Multimodal Data | *Python, Scikit-learn, TensorFlow, Librosa*

- Curated 6,400 MRI images (4 dementia classes) and DementiaBank speech recordings with demographic + MMSE metadata.
- Extracted MFCC features for speech; designed an ensemble (RF + NB + KNN) to outperform individual ML classifiers.
- Applied transfer learning on MRI scans (ResNet50, VGG16, InceptionV3, DenseNet169), with DenseNet169 achieving the highest accuracy.
- Addressed class imbalance and limited sample size through targeted augmentation, reporting outcomes across accuracy, precision, recall, F1, AUC.

Enterprise Operational Analytics with Forecasting and Monte Carlo Simulation | *SAP Analytics*

- Segmented customers based on sales and geographic trends using SAP Analytics Cloud, providing actionable insights to optimize regional performance and improve service strategies.
- Developed a 48-month sales forecasting model using triple exponential smoothing; fine-tuned alpha, beta, and gamma parameters to enhance forecast reliability.
- Designed interactive dashboards and pivot-based visualizations to analyze product categories, regional trends, and profitability KPIs, supporting strategic decision-making for sales and resource allocation.
- Built a Monte Carlo simulation in Excel using 2000+ randomized inputs to estimate manufacturing equipment maintenance costs, enabling budget planning based on cost probability distributions.

Airline Website Server Management System | *Amazon AWS*

- Developed a high-availability web infrastructure using AWS services to host and manage an airline website with near-zero downtime.
- Deployed the website on Amazon EC2 instances with Apache web servers, storing static content in Amazon S3 for scalable and secure hosting.
- Configured an Elastic Load Balancer (ELB) to distribute incoming traffic evenly across multiple EC2 instances, improving reliability and performance.
- Implemented Auto Scaling policies linked with Amazon CloudWatch metrics to dynamically adjust instance capacity based on real-time load.
- Integrated Amazon SNS for automated email alerts, ensuring proactive notification of performance issues and system events.

Certifications

- **AWS Academy Graduate – Machine Learning Foundations** — *AWS*, May 2022
- **Introduction to Microsoft Azure Cloud Services** — *Coursera*, Feb 2025