

# VISHAL NAGARAJAN

Portfolio: <https://vishaln15.github.io>

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## EDUCATION

- University of California, San Diego** San Diego, United States  
• *Master of Science - Computer Science; GPA: 3.95/4.0* Sep 2022 - Jun 2024 (Expected)  
*Courses:* Principles of AI, Recommender Systems and Web Mining, Graduate Networked Systems, Statistical NLP
- SSN College of Engineering (Affiliated to Anna University)** Chennai, India  
• *Bachelor of Engineering - Computer Science and Engineering; GPA: 8.55/10.0* Aug 2018 - Jun 2022  
*Courses:* Machine Learning, Data Structures and Algorithms, Software Engineering, Operating Systems

## SKILLS

- **Languages:** Python, Go, Java, C++, C, SQL, JavaScript, HTML, CSS, L<sup>A</sup>T<sub>E</sub>X
- **Frameworks:** PyTorch, TensorFlow, Scikit-learn, NLTK, Pandas, NumPy, Keras, Flask, ReactJS, Angular
- **Tools:** Docker, Git, MySQL, MongoDB
- **Platforms:** Google Cloud Platform, Linux, Web, Raspberry
- **Soft Skills:** Design Thinking, Leadership, Time Management, Teamwork, Flexibility

## EXPERIENCE

- Solarillion Foundation** Chennai, India  
• *Research Assistant and Teaching Assistant* Jun 2020 - Jun 2022
  - **Publication:** End-to-end optimized arrhythmia detection pipeline using machine learning for Ultra-Edge devices - Research project developed with Python to detect Atrial Fibrillation in subjects using ECG signals. Applied machine learning algorithms that used only **0.508 KB** of RAM on Raspberry Pi 3. Published in the 20th **IEEE International Conference on Machine Learning and Applications (ICMLA)**. [Code Link]
  - **Flight Delay Prediction Project:** Developed a novel two-staged pipeline containing XGBoost Classifier and Regressor using Python to improve performance of evaluation of flight delay in minutes. Data processing was performed on over 10 million datapoints by **combining flight and weather data** based on time of the flight date. Achieved a Mean Absolute Error of 13.82 minutes, and  $R^2$  score of 0.94. [Code Link]
  - **Website Maintenance:** Managed official website of Solarillion Foundation using Javascript. Revamped research and contact pages using Google App Script with better UI. Delivered the changes in 1 day. [Code Link]
  - **Teaching Assistant:** Guided **5 students** through assignments in Python and basics of Machine Learning.
- SSN College of Engineering (Affiliated to Anna University)** Chennai, India  
• *Undergraduate Student Researcher* Sep 2021 - Feb 2022
  - **Publication:** Scalable machine learning architecture for neonatal seizure detection on ultra-edge devices - Research work culminated into publication and presented at the 2nd **International Conference on Artificial Intelligence and Signal Processing (AISP)**. Explored various signal filtering methods, segmented signal into window lengths to pass input to ML models. Secured **87%** sensitivity score with **4.84 KB** memory footprint. [Code Link]

## SELECTED PROJECTS

- Sentiment Analysis Flask App using Docker and Google Cloud** San Diego, United States  
• *Python3, Flask, Docker, Google Cloud Run* Dec 2022  
Developed a small scale sentiment classification web application that takes a sentence as input. Trained XGBoost model classifies the input text. The app is wrapped using Flask, containerized using Docker, and deployed on Google Cloud Run. [Web-Application-Link] [Code-Link]
- Early sepsis prediction using clinical radiology reports and vitals** San Diego, United States  
• *LSTM, CNN, DNN, Scikit-Learn, NLTK, SciSpacy* Dec 2022  
Collaborated with a multi-disciplinary team to build Deep learning (DL) models using TensorFlow that take structured vitals and annotated clinical reports of patients to predict sepsis by utilizing the innate time-series properties. LSTM + Word2Vec delivered **66%** AUC score and **37%** PPV score on the highly imbalanced dataset.
- TechWorld** Chennai, India  
• *E-commerce web application using MERN stack* Feb 2022  
Managed team of 3 and designed a web app with functionalities enabling users to purchase and admin to add products. Sign-in is authenticated using JWT (JSON Web Token). Cookies are saved to store cart items. Order history is stored in MongoDB database that is accessed by admin using mongoose tool. [Code Link]

## OPEN-SOURCE CONTRIBUTION

- PySigPro** Chennai, India  
• *Python package for EEG/ECG feature extraction* Dec 2021  
Collaborated a one-stop open-source **Python** package for signal processing and feature extraction of HRV features, and features pertaining to seizures. Features frequently used in EEG and ECG signal processing are included from time-domain and entropy-domain. To be published as PyPI distribution. [Code Link]