VISHAL NAGARAJAN

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Education

- **University of California, San Diego** — San Diego, United States
  Master of Science - Computer Science; ***GPA: 4.0/4.0*** — *Sep 2022 - Jun 2024 (Expected)*
  Courses*: AI: Probabilistic Reasoning and Learning, Recommender Systems and Web Mining, Biomedical 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, Artificial Intelligence, Data Warehousing and Data Mining, Data Structures, Design and Analysis of Algorithms, Objected Oriented Programming, Social Network Analysis, Software Engineering*

Skills

- **Languages**: Python, Java, C++, C, SQL, JavaScript, HTML, CSS, LaTeX
- **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 Maintanence**: 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**]