Nirmal Prabhu

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EDUCATION

MSE Computer Science, Johns Hopkins University, Baltimore USA **Expected 2025**

B. Tech CSE, Vellore Institute of Technology, Chennai, India CGPA –3.7/4 **2023**

Coursework Machine Learning, Software Engineering, NLP, Cybersecurity, Data Analysis, Data Structures, Algorithms, Social Networks

SKILLS AND CERTIFICATIONS

Python, C++, TensorFlow, PyTorch, SQL, AWS, Azure, GCP, NumPy, Pandas, Git, MERN, Seaborn, Tableau, Matplotlib, NLTK, Excel

AWS certified cloud practitioner, Microsoft AI900, Machine Learning A-Z, Google and IBM Professional Data Science

WORK EXPERIENCE

Graduate Research Assistant, CDEM Lab, Johns Hopkins Medicine **January 2023 – Present**

- Collaborated on flu and COVID-19 hospitalization forecasting employing **N-BEATS** model in **PyTorch**, analysing data from 2008 to 2024. Interpreted 16 years of historic flu data on **Python**, **NumPy**, **SciPy**, **Pandas**, **Matplotlib** to make data-driven decisions
- Improved ensemble strategies for time series forecasting, with data from the **Flu Sight Forecast Hub** and **CDC**. Accounted for exogenous variables, included COVID-19 hospitalizations into forecast, pipeline real-time updates to Flu Sight Forecast Hub.

Graduate Research Assistant, LCICM, Johns Hopkins Medicine **September 2023 – Present**

- Explored machine learning approaches in emergency medicine within a team of 8 researchers, analysed electronic health data to identify factors modulating delirium risk, built predictive models for ICU delirium prediction.
- Leveraged **Python**, **NumPy**, **SciPy**, **Pandas**, **Matplotlib**, **Statsmodel** for robust data analysis, preprocessing, feature engineering, constructed a multidimensional feature space on a real-world dataset, **PMAP** of 30,000 ICU patients, curated at Johns Hopkins.
- Assembled logistic regression, random forest**, CatBoost** and gradient boosted trees models in **Scikit-learn**, created rich dashboards and visualizations, assessed data quality, useability of EEG, Delirium data, feature importance through SHapley Additive exPlanations (**SHAP**) values, plots for enhanced interpretability, examined unknown features associated with delirium

Research Intern, VIT University and A-star Research Singapore **January 2023 – April 2023**

- Collaborated on cutting-edge projects in distillation and distributed deep learning, engineered compact models using **TensorFlow**, incorporated **qsparse** to execute diverse pruning, quantization manoeuvres for optimal model compression by > 30% across diverse healthcare datasets, **MedMNIST.**
- Investigated information propagation from an ensemble of **TensorFlow** teacher models to a single student model, explored distributed training approaches leveraging **Python** scripts and **AWS EC2 compute**, crafted a sync stochastic gradient descent algorithm to address staleness and stragglers in distributed deep learning clusters.

Machine Learning Intern, University of Newcastle, Nagasaki University **June 2022 – October 2022**

- Led a research project on continual learning in Cybersecurity, induced streaming data via **Python**, **NumPy**, and **Pandas**, on the **CICDS** intrusion detection dataset 2017, applied **Hoeffding Adaptive Trees, PA** among other stream learning algorithms harnessing **River** and **Avalanche** libraries, capitalized on transfer learning information from continual to deep learning classifier.
- Managed a team of 4 to interpret over 9000 complex malware files to grayscale images on **Python,** utilized **PyTorch CNNs** for image preprocessing, applied stream learning, deep learning techniques to classify over 9000 malware binaries into 25 classes.
- Authored 1 manuscript, 3 research articles reflecting project process, state-of -the art in the field of continual learning.

Intern, Microsoft and NASSCOM **October 2021 – June 2022**

- Deployed a dental health web application exploiting **Azure Health** and Language Understanding Intelligence Service **LUIS NLP** modules for post-operative symptom triaging and consequent diagnosis, catering to 14 languages. Generated detailed reports about patient's status, based on gathered information, potentially allowing doctors to assess patient status remotely.
- Employed **Azure Web, GitHub Pages** to create and host project, documented process, design, implementation, and integration of Azure services, formulated a similar application for post-operative surgical wounds.
- Presented real-world scenarios, showcasing application's functionality, over a video submission to a Microsoft expert panel.

PROJECTS

Xpath – enhancing commute experiences, Johns Hopkins University **January 2024 – April 2024**

- Engineered a travel-based match-making platform on **React**, **Django**, enhancing commute experiences averaging 55 minutes a day in the US, by connecting users with similar schedules, interests using planning. recommendations, chat, security features.
- Implemented complex routing and matching algorithms with **Google Places API**, **Neo4j** and **MySQL**, augmenting route and interest-based user pairings, deployed on **Digital Ocean** on a **GitHub** CI/CD pipeline, attained a 95+% uptime.
- Collaborated with a development team of 6, following the **Agile** software development cycle, with **scrum** calls, sprint-planning bi-weekly **sprints**, **Agile retrospectives** at the end of sprints, prioritization and **product backlogs**, monitored on **GitHub.**

BuffetFinder **July 2023 – Present**

- Devised a prototype application to test custom strategies, identify trends and make data-driven decisions on stock market data, gathered data from **Yahoo Finance API**, applied web scraping methods using **Python** libraries **BeautifulSoup** and **Scrapy**
- Applied data preprocessing and analysis practices through **Numpy** and **Pandas**, composed filters to screen stocks and identify trends, patterns, insights and enduring investments based on a custom variation of Buffett's value investing principles.