Mukund Yadav

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Education

MS in Computer Engineering, Virginia Tech, GPA: 4.0/4.0 — Jan 2023 – Dec 2024
Thesis: Detection Theory with Machine Learning
GTA: ECE4525 Game Design, CS2506 Computer Organization II, ECE2564 Embedded Systems.
Courses: Adv. Machine Learning, Optimization in Machine Learning, Adv. Computer Vision, Deep Learning.

BS in Electrical and Electronics Engineering, Purdue University — Aug 2018 – May 2022
Capstone: Industrial Internet of Things Sensor Interface Design for Industry Energy Management — West Lafayette, IN
Tutor: Multivariate Calculus, Linear Algebra, Differential Equations, Discrete Math

Experience

Graduate Research Assistant, Virginia Tech — Jan 2023 – present
- Created a **Reinforcement Learning Agent** that maximizes the probability of signal detection(Pd) and minimizes the probability of false alarm(Pfa) when detecting the signal.
- Implemented **Proximal Policy Optimization** algorithm to find Pd and Pfa values after each observation state of the agent.
- Plotted the results to compare it with classical methods of solving the same problem, showing a **30% improvement** in Pd/Pfa ratio over classical methods.

App Developer, Virginia Tech — May 2023 – Aug 2023
- Created a cross-platform app for the **Web, Android, and iOS**.
- Developed the web app with **React + Express in Typescript.**
- Implemented **REST API** that gets the user's location, allows user to send texts and images to the backend.
- Developed the mobile app in **Dart** using **Flutter**.
- Deployed the app on **AWS** using their **RDS** as the database.

Voice Assistance Research, UROP | Purdue School of Engineering and Technology — Aug 2021 – Dec 2021
- Developed a voice assistant with improved word recognition using Python.
- Created a **neural network** where the input would be the words said by the user as a string using **pyttsx3** and the output would be the best-matched word from a dataset with frequent medical terms.
- Revamped the pre-existing code to make it more logical, readable, and scalable.
- Enabled users to verbally ask about the medications they need and the VA would say it back to them.

Full stack developer, MURI | Purdue School of Engineering and Technology — May 2021 – Aug 2021
- Created a **web application** for the Grand Marble Map of Rome project.
- Developed the backend using **Django-Python**.
- Used **SQLite3** as the database during development stage which would keep 3D models of the map of Rome as the data.
- Migrated the database from SQLite3 to RDS on AWS during the production stage and created a lambda function script that would interact with the database and the application.
- Deployed application on **AWS** by creating an **EC2 instance** with **nginx** and **gunicorn.**

Projects

Contradictory, My Dear Watson, Python/NLP — Jan 2023 – May 2023
- Developed an **NLP-based transformer** model for a Kaggle competition
- Solved the problem of dealing with multiple languages in the dataset by translating the sentences before training.
- Visualized the data for better insight using **seaborn** and **keras**.
- Coded the XLM transformer model for **sentimental analysis** using roBERTa.
- Improved the model's accuracy from 76% to **93%**.

Face Identification App, Python/ML — May 2022 – Dec 2022
- Developed a face Identification App using **TensorFlow.**
- The app would allow a user to protect other apps on their phones.
- Inspired by a paper on **Siamese Neural Networks**. Replicated the paper/developed the code for the app.
- Created a model using **convolutional neural network** for one-shot learning.
- Developed a 6-layer Deep Neural Network for best results.
- Deployed the model and made the app using **Kivy**.

Skills

Machine Learning (TensorFlow, PyTorch, Scikit-learn, Keras, Numpy, Pandas Understand/implement ML algorithms)

Front end development (React, Tailwind CSS) | **Back end development** (Django, NodeJS, ExpressJS, MySQL)

Data Structures (Knowledge of/Develop algorithms using: Trees, Hash Maps, Graphs, Linked Lists, Stacks, Queues)

Programming Languages (Python, C++, C, Typescript, SQL, R)

Software/Hardware (MATLAB|ROS|Arduino|Raspberry Pi|Cadence|EAGLE.)

Cloud Computing (AWS, EC2, Database, Scripting, Hosting) | **Linux** | **Git**