Mukund Yadav

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Education

MS in Computer Engineering, Virginia Tech, GPA: 4.0/4.0 — Jan 2023 – Dec 2024
Thesis: AutoCAT, Cache Security using Reinforcement Learning — Blacksburg, VA
Graduate Teaching Assistant: CS2506 Computer Organizations, ECE2564 Embedded Systems
Courses: Advanced Machine Learning, Deep Learning, Computer Vision

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
Courses: Data Structures and Algorithms | Intro to Biometrics with Machine Learning

Experience

Graduate Research Assistant, Virginia Tech — Jan 2023 – present
- Implementing a Cache Security Model called AutoCAT using **Reinforcement Learning.**
- Testing the AutoCAT code on other research papers to verify its effectiveness.
- Expand the model to other CPUs by writing C and Python code.

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.
- Allows 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.**

Head of Communications, Team Vyadh | Students for Exploration and Development of Space — Mar 2019 – Jul 2020
- Engineered a **rover** that would compete in University Rover Challenge, 2020.
- Developed a communication system called GCS(Geographical Communication System) that allowed the team to interact and monitor the rover using **node.js** and hosted it on a local Linux server.
- Integrated the **Arduino**/**MATLAB**/**Python** codes **using ROS**, responsible for rover operation.
- Lead and managed a sub-team of three freshmen, onboarded and mentored them about the system/project.
- Qualified as **one of 32 teams out of 500** for URC, 2020.

Projects

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**.

Baseball Stats Analysis Model, Python/SQL — Apr 2022 – May 2022
- Developed a model using Python that would fetch baseball stats data in JSON format from an API.
- Developed the algorithm to **flatten the heavily nested data** and fed it to a **SQLite** table using the **pandas** library.
- Users could pass the game ID and the path to it, and then they would be able to run SQL queries through the terminal and analyze the data.

Skills

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

Front end development *(ReactJS|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**