Shivani Madhavan

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PROFESSIONAL SUMMARY

I am pursuing a master's degree in Electrical Engineering and Information Technology at Anhalt University of Applied Sciences. Passionate about developing innovative ML/AI solutions, I bring a strong work ethic, creativity, dedication, willingness to learn, and reliability to my work, focusing on impactful applications in automation and vehicle technologies. I have consistently met project deadlines by utilizing my advanced technical and analytical skills in debugging and resolving software issues efficiently, which has led to increased efficiency within the software engineering team. Additionally, I hold a German A2 certification, enhancing my communication skills in a multilingual environment.

SKILLS

- **Programming skills:** Python programming language, C#, Simulink
- **Technologies:** MATLAB, ROS (Robot Operating System), Linux (Configuring and Managing), Computer Vision, Machine Learning, Deep Learning, Neural Network, Reinforcement Learning, Data Analysis, PyTorch, Numpy, Quality Assurance, Unit Testing, Debugging, Root cause analysis
- **Software Tools:** Visual Studio code, Visual Studio, Gazebo, Azure devops, SQL Server Management Studio, MS Office Suite, version control tools (Git)
- **Soft Skills:** Strong communication skills, creativity, innovative thinking, ability to work in a team, commitment, initiative, perceptiveness, and presentation skills

EXPERIENCE

Junior Software Engineer, Softura – Chennai, India April 2021 – Aug 2023

- Application Development: Proficient in C# programming skills and MS-SQL, with UI experience in JavaScript, asynchronous request handling, and creating/managing RESTful APIs to ensure efficient system communication.
- Software Architecture and Enhancement: Implemented Web API design patterns and MVC architecture, utilizing form validation and server-side scripting to enhance application functionality and performance.
- Project Leadership and Collaboration: Developed and managed .NET MVC applications for user and role management, led a team in troubleshooting software issues, and successfully completed projects for Elior Groups and Henry Construction Company, automating processes and fostering effective team collaboration.
- Machine Learning and AI: Experience in ML/AI, including developing predictive models with Python (TensorFlow, scikit-learn), implementing machine learning algorithms to improve automation, integrating AI solutions into existing platforms, and conducting data preprocessing, feature engineering, and model evaluation.

EDUCATION

University of Anhalt, M.Eng. in Electrical and Computer Science Engineering Oct 2023 – Present

- GPA: 1.3
- **Coursework:** Linux, Machine Learning, Autonomous Systems, Software Design, MATLAB, Real-Time Systems, Systems Programming, Operating Systems, Control Systems

Panimalar Engineering College, B.Eng in Electrical and Electronics Engineering Aug 2017 – May 2021

- GPA: 1.7
- **Coursework:** C programming, Python, Embedded C, Control Systems, Matlab, Arduino, Raspberry Pi.

CERTIFICATION

- **Machine Learning:** Udemy
- **Python Programming:** Coursera
- **Matlab and Machine Learning Onramp:** MathWorks
- **ASP.NET Fundamentals:** Softura

PROJECTS

Lateral Control of Vehicle Dynamics Aug 2024

- Developed a control system to stabilize the lateral motion of a car using a simplified single-track model, focusing on vehicle dynamics under steering inputs.
- Designed and implemented Proportional-Integral (PI) controllers with gain scheduling to manage the vehicle's yaw rate and sideslip angle, ensuring stability across varying speeds.
- Simulated and validated the control system performance using MATLAB and Simulink, analyzing time and frequency domain responses to optimize vehicle handling.

Kitchenware Classification Using Machine Learning Aug 2024

- The project classifies kitchenware items (cups, large spoons, knives, scissors) using techniques like Sobel-edge detection, Keras, Convolutional Neural Networks, and tools like TensorBoard.
- Applied Deep Learning algorithms to develop and optimize machine learning models for software applications, enhancing the model's performance.
- A machine learning model was created using the dataset, with improvements made through preprocessing techniques, pre-trained models, and dataset expansion.
- The model's accuracy and efficiency were further enhanced through continuous learning via feedback, achieving the project's goal of an adaptive machine learning application using the PyQt5 library.

Obstacle Detection and Avoidance Using LiDAR and TurtleBot3 Feb 2024

- This project focuses on developing an obstacle detection and avoidance system using LiDAR and TurtleBot3 for autonomous navigation. It examines various sensor technologies, such as LiDAR and cameras, and discusses the integration of hardware components like Raspberry Pi 4 and TurtleBot3.
- The project focused on enhancing the reliability and seamless operation of the robot's software and obstacle detection. The ability to accurately detect obstacles was deemed fundamental to the robot's overall performance and safety during autonomous navigation.
- The focus on refining obstacle detection algorithms laid a solid foundation for enhancing the overall performance and reliability of the robot in navigating complex environments autonomously.
- It highlights issues faced with initial obstacle avoidance approaches and presents a final algorithm that enhances TurtleBot3's ability to detect and navigate around obstacles in complex environments.

Electric Vehicle Maneuvering System Sept 2020

- This code is designed for a two-motor control system, where the motors' speeds are adjusted based on sensor inputs: IR sensors determine the direction of movement, PWM input controls the overall speed of the motors, Hall effect sensors likely provide feedback for debugging.
- The logic allows the vehicle to adjust its speed and direction based on sensor input. The motors and Hall sensors work together in a feedback loop to ensure accurate speed control.
- The Hall sensors monitor the rotational speed of the motors by detecting changes in the magnetic field as the motor shaft rotates. This data is used to adjust and stabilize motor speed, especially when external conditions cause changes in motor performance.
- The feedback from the Hall sensors is critical in maintaining consistent motor operation and responding correctly to control inputs such as changes in the potentiometer setting or IR sensor detection.