Tulasi Sainath Polisetty

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EDUCATION

Masters in Science, Mechatronics, Robotics & Automation Engineering Present - May 2024
Arizona State University, Tempe, AZ, USA **GPA:3.94**
Teaching Assistant (EGR 314) - Embedded Systems Design II

Bachelors in Electronics and Communication Engineering Aug 2019
Osmania University, Hyderabad, India

Technical Skills

Programming: Python, C/C++, Embedded C, PHP, JavaScript
Machine Learning & AI: TensorFlow, TFLite, PyTorch, ONNX, OpenCV, scikit-learn
Data Science Tools: Pandas, NumPy, Matplotlib, SQL
Hardware for AI/ML: NVIDIA Jetson Boards, GPUs, Coral TPU, raspberry-Pi and Arduino boards, TTGO
Software & Platforms: CUDA, AWS, Docker, Git
Linux Tools: Bash Scripting & Embedded Linux
Protocols & Networking: HTTPS, REST APIs, MQTT, WebSockets, SPI, I2C, UART, CAN

EXPERIENCE

Robotics Intern
HC Robotics, Tempe, USA Jun 2023 - Aug 2023

- Developed object recognition models using OpenCV for drones, enhancing tracking accuracy by 30% and reaction time by 25%.
- Implemented pixel tracking algorithms for drone surveillance systems, improving precision in dynamic environments by 20%.
- Optimized CNN algorithms on Ambarella Z3, reducing memory usage by 25% through efficient graph node utilization.
- Advanced tracking algorithm efficiency on NVIDIA Jetson Nano with quantization and Huffman coding, achieving a 15% increase in computational speed.
- Assisted in the design of PID control algorithms for 2-Axis gimbal systems, improving reaction speed and system stability for tracking applications by 20%.
- Explored Deep Deterministic Policy Gradients (DDPG) for velocity control in gimbal systems, aiming to enhance tracking accuracy and responsiveness.
- Contributed to the integration of AI algorithms into real-time embedded systems, leading to a 10% overall increase in system performance and efficiency.

Hardware and Firmware Engineering Intern
Nutek Technologies Pvt Ltd, Hyderabad, TS, India Apr 2021 - Dec 2021

- Engineered firmware for a novel battery protection circuit, achieving 15% more efficient power management.
- Contributed to R&D in fast charging technology, integrating it into existing hardware with 10% faster charging.
- Managed data analysis, improving data organization and modeling efficiency by 20%.

Hardware Engineering Intern
Aksharlogic Systems Pvt Ltd, Bengaluru, KA, India Jan 2020 - Jan 2021

- Engineered firmware for TI Microcontrollers, focusing on database integration and backend development.
- Maintained server applications, ensuring dynamic database performance and integrity.
- Designed and managed product websites, integrating IoT devices for system functionality.

COURSE PROJECTS

- **IMUNet: Regression Architecture for IMU Navigation and Positioning:** Engaged in recreating and expanding the ”IMUNet” paper, focusing on data-driven methods for accurate and efficient position estimation using IMU measurements. Utilizing one-dimensional CNN architectures for edge device implementation and conducting comprehensive evaluations with various datasets, including a self-collected dataset using arduino IMU sensors and Google ARCore API. Work involves both PyTorch and TensorFlow frameworks, as well as real device implementation.
- **Pest Control Using CNNs and ESP32:** Currently developing a system for real-time pest recognition in agricultural settings, using Convolutional Neural Networks for video processing. The project aims to integrate real-time video analysis with an ESP32 controller for effective pest control solutions. Focusing on optimizing model efficiency for real-time processing and exploring hardware integration nuances.
- **AI-Driven Gesture-Controlled Car:** Developed a globally operable gesture-controlled car using Arduino and TensorFlow Lite. Implemented a 1D Convolutional Neural Network for real-time gesture recognition, achieving over 98% accuracy. Utilized MQTT protocol for robust remote maneuvering from anywhere in the world. Currently enhancing the system with a live streaming feature via WebSockets for improved user interaction and control.
- **AI-Based Health and Fitness Tracker:** Developed a fitness tracker using a basic feed-forward neural network, achieving over 97% accuracy in personalized health monitoring, with real-time data processing and user-specific health metrics.
- **Machine Learning for Posture Detection:** Designed a system using 1D Convolutional Neural Networks (CNNs) for posture tracking, attaining 98% accuracy in detecting various postures to prevent bed-related disorders.
- **Environmental Sound Detection with ML:** Created a Convolutional Neural Network model for high-pitched sound detection, aiding hearing-impaired individuals with 99% classification accuracy, employing Adaptive Variational Modal Decomposition and Pseudo Wigner-Ville Distribution for feature extraction anlong with entropy measurements.
- **Voice Command Recognition with AI:** Developed an AI system for voice command recognition, achieving over 95% accuracy, tailored for real-world applications and integrated with Arduino BLE Sense boards for IoT applications.
- **Advanced Speech to Text Conversion with AI:** Created an AI-based speech-to-text conversion system, comparing transformers, CNNs, and LSTMs using Mel Frequency Cepstral Coefficients (MFCCs) and spectrograms, and achieved transcription accuracy of (60%).