Niranjan Ravikumar

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Summary

- Electrical Engineer with over 5 years of professional experience in machine learning data annotation, AI model training, and embedded systems development.
- Strong foundation in power electronics, industrial control systems, and renewable energy systems, with expertise in MATLAB, Simulink, and embedded C programming.
- Proficient in designing and implementing technical solutions for electric vehicles and smart systems, with hands-on experience in microcontroller programming and IoT applications.
- Currently pursuing a Master of Science in Electrical Engineering, with coursework in advanced power electronics, industrial control systems, and IoT, aiming to drive innovation in the automotive electronics sector.

Education

University at Buffalo, The State University of New York — Buffalo, NY
Master of Science in Electrical Engineering — *Expected Dec 2024*
Relevant Coursework: Power Electronics, Industrial Control Systems, Wearables and Implantable Sensors, Microelectronic Device Fabrication, Robotics - I, Renewable Distributed Generation and Storage, Photovoltaic Technology and Applications, Big Data Analytics, Statistical Machine Learning, Internet of Things

S. A. Engineering College — Chennai, India
Bachelor of Science in Electrical Engineering — *Apr 2017*

Technical Skills

Programming Languages: Java, Embedded C, Python, C, C++, LaTeX
Software: MATLAB, AutoCAD, Creo, Revit, Altium, LTSpice, Microsoft Office, Visual Studio, Git
Hardware & Embedded Systems: Arduino, Raspberry Pi, PLC, HMI, ARM, I2C, SPI, UART, CAN
Data Annotation & AI Model Training: ML Data Annotation, NLP, ASR, Model Evaluation and Validation
Control Systems & Power Electronics: Power Electronics Design, Inverter Design, Motor Control

Work Experience

University at Buffalo — Buffalo, NY
Graduate Teaching Assistant in Fundamentals of Energy Systems, Power Electronics — *Feb 2024 – Present*
- Evaluated assignments and quizzes for a cohort of 85 undergraduate students, providing timely feedback to reinforce understanding of electrical machines, power systems, and energy conversion principles.
- Proctored exams and facilitated in-class assignments to assess student progress, ensuring adherence to academic integrity and evaluation standards.
- Maintained and updated student grades in the university's academic system, utilizing data management skills and ensuring accuracy and confidentiality.

Amazon Development Center — Chennai, India
Machine Learning Data Associate - I — *May 2022 – Aug 2023*
- Normalized and curated over 3,500 customer questions and answers to feed into AI models, enhancing the accuracy and relevance of the system's responses in real-time shopping scenarios.
- Evaluated the plausibility and specificity of more than 5,000 customer inquiries, ensuring high-quality data inputs for model training and refinement.
- Trained the AI model with edge cases, including questions with no possible answers, to improve its ability to handle complex or ambiguous queries, thereby enhancing user experience.
- Identified and integrated specific commands into Alexa that required human intervention, improving the system's capability to understand and process diverse user inputs.

Black Bolt Technologies — Chennai, India
Android Developer Intern — *May 2021 – Jul 2021*
- Successfully delivered four Android applications, focusing on both functional enhancements and user interface improvements to meet client requirements.
- Led the debugging process and implemented major functional and layout changes, ensuring applications were stable, user-friendly, and met performance benchmarks.
- Established and configured Firebase projects with SHA fingerprints for all four applications, enabling secure and reliable backend services including real-time database and authentication.
- Developed and deployed a Python-based web scraping script to extract data from e-commerce platforms like BigBasket and Grofers, facilitating data analysis and integration into organizational tools.
- Designed and developed a productivity application, Hourly, featuring a Pomodoro timer, hourly tracking, and productivity statistics to enhance user efficiency and time management.

Amazon Development Center Chennai, India
Data Associate – I *Mar 2019 – Mar 2020*

- Identified and integrated specific command data into Alexa, facilitating enhanced voice recognition capabilities and improving system responsiveness for diverse user inputs.
- Enhanced Automatic Speech Recognition (ASR) and Natural Language Processing (NLP) systems to better handle various accents and genders, contributing to more accurate and inclusive voice interactions.
- Achieved an exceptional transcription accuracy rate of over 96% by meticulously transcribing more than 35,000 files within 18 weeks, ensuring high data quality and reliability.
- Mentored and guided three associates, helping them achieve quality goals and improve their performance, fostering a collaborative and high-performance work environment.

Valeo Chennai, India
Annotator *Mar 2018 – Mar 2019*

- Prepared and annotated input files for self-driving cars manufactured by Audi and Daimler, enhancing the vehicle's ability to perceive and interpret its environment.
- Categorized and labeled objects within files, including roads, lanes, barriers, vegetation, and vehicles, to enable precise understanding and decision-making by autonomous driving systems.
- Annotated over 150 files with high accuracy, performing thorough quality assurance to validate and ensure the precision of annotations, contributing to reliable autonomous vehicle performance.
- Conducted Key Performance Indicator (KPI) assessments on 25 files to evaluate and ensure the quality and effectiveness of the annotation process.
- Contributed to a 63% increase in annotation efficiency and data quality, enhancing the overall project profitability and performance.

Projects

ML IoT-based Motorcycle Helmet *2024*
Designed an IoT-enabled motorcycle helmet incorporating an accelerometer, gyroscope, pulse sensor, GSM, GPS, and pressure sensors to enhance rider safety. The system detects accidents and autonomously sends alerts to nearby hospitals with the rider's location, alongside a security alarm for unlatched helmet usage. Leveraged machine learning to analyze sensor data and minimize false positives in accident detection, optimizing safety measures. Transitioning from an Arduino-based prototype to PCB implementation for improved compactness and durability.

Microgrid System *2023*
Created a comprehensive blueprint for a Concentrated Solar Power (CSP) microgrid in Ghana to ensure reliable power for critical facilities such as the New Wa Regional Hospital, while also supporting non-critical loads like a local high school. The design integrates solar energy with thermal and battery storage, offering black-start capabilities to maintain power supply during grid outages. Advanced control and automation features, including SCADA, enable efficient load management, grid interactivity, and system resilience. The project emphasizes sustainability and cost-effectiveness, balancing renewable energy sources with minimal reliance on diesel backup.

Electric Car *2023*
Designed and simulated an efficient inverter for an electric vehicle traction system, achieving 98.2% efficiency. Calculated key parameters including modulation indices, RL parameters, and power losses under various operating conditions. Analyzed thermal resistance requirements for IGBT and diode switches to optimize heat dissipation. Successfully validated the design through MATLAB simulations, ensuring system stability and performance across different torque and speed levels.

Industrial Control Systems Design *2023*
Conducted a comprehensive study and design of an unstable electrical system with four states. Performed eigenvalue analysis to determine system stability and developed a state-feedback controller to stabilize the system. Designed and implemented an observer to estimate system states and validated controllability and observability. Simulated both open-loop and closed-loop system responses using MATLAB, demonstrating significant performance improvements.

Certifications

- Energy Production, Distribution & Safety Specialization
- Machine Learning Specialization by Andrew Ng
- Java Programming Masterclass for Software Developers
- BEC Vantage B2