Jiakun Wang

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Education

Bachelor of Science in Engineering, Biomedical Engineering, Cleveland, OH
Case Western Reserve University (CWRU)

Bachelor of Arts, Computer Science, *Case Western Reserve University (CWRU)* Cleveland, OH

Research Experience

Automatic Skull Stripping for Mouse 01/2024 – 05/2025
Advisor: Dr. Xin Yu Cleveland, OH
Department of Biomedical Engineering, Case Western Reserve University

- Developed and optimized an algorithm to automatically strip the mouse skull out of the image using a machine-learning network
- Evaluated and assessed the efficiency of the algorithm

Muscle Force Measurement Tool with LED indication 01/2023 – 05/2023
Advisor: Dr. Matthew Williams Cleveland, OH

- Designed and developed an innovative tool for real-time muscle force measurement, integrating precise force sensors and LED feedback systems to improve user awareness.
- Implemented advanced signal processing techniques to accurately translate muscle force data into visual LED indications, ensuring real-time responsiveness and accuracy.
- Collaborated with biomechanics experts to validate the tool's effectiveness in clinical and sports training scenarios, achieving measurable improvements in performance tracking.
- Optimized hardware and software integration to create a cost-effective, portable solution for diverse applications in rehabilitation, physical therapy, and athletic training.

Senior Project: Wound Care Chatbot 08/2023 – 05/2024
Advisor: Dr. Matthew Williams and Dr. Colin Drummond, CWRU Cleveland, OH

- Developed an intelligent chatbot system to provide tailored wound care guidance, leveraging Natural Language Processing (NLP) technologies.
- Collaborated with healthcare professionals to integrate medical best practices into the chatbot's response framework, ensuring clinical accuracy.
- Designed and implemented a user-friendly interface to improve accessibility for patients with diverse needs and technical proficiencies.
- Conducted extensive user testing and iterative improvements to optimize system performance and enhance user experience.

Course Projects

Silicon Chip Design and Fabrication for High-Performance Applications 08/2024 – 12/2024
Cleveland, OH

- Developed a custom silicon chip architecture tailored for high-performance computing and low-power consumption, addressing modern computational demands.
- Utilized state-of-the-art EDA (Electronic Design Automation) tools to design, simulate, and verify chip functionality, ensuring optimal performance and reliability.
- Collaborated with a multidisciplinary team to oversee the fabrication process, ensuring design integrity and successful integration with downstream systems.
- Conducted comprehensive post-fabrication testing and debugging, achieving a 95% yield rate and ensuring the chip met stringent industry standards.

Machine Learning Model for Human Activity Recognition Using Mobile Sensor Data 08/2024 – 12/2024
Cleveland, OH

- Developed a machine learning model leveraging mobile sensor data (accelerometer, gyroscope, GPS) to accurately classify human activities such as walking, running, sleeping, and traveling by car.
- Implemented feature engineering techniques to extract time-domain and frequency-domain features, optimizing model performance for diverse activity recognition scenarios.
- Trained and validated multiple algorithms, including Random Forest and Neural Networks, achieving an accuracy of over 90% in activity classification.
- Analyzed large datasets from mobile devices to identify behavioral patterns, enabling insights for healthcare, fitness tracking, and smart mobility applications.

Teaching Experience

Lead Teaching Assistance, *Math 302, Discrete Mathematics* 07/2024 – 08/2024
Cleveland, OH

- Provided individualized support to clarify course materials and solve challenging problems
- Graded all assignments, quizzes, and exams with attention to accuracy and fairness, offering detailed feedback to enhance student learning

Teaching Assistance, *ENGR 210, introduction to circuits and instrumentation* 01/2023 – 05/2025
Cleveland, OH

- Graded assignments, quizzes, and exams, ensuring fairness and providing constructive feedback to help students improve.
- Facilitated hands-on lab sessions, demonstrated experimental setups, and ensured adherence to safety protocols.

Teaching Assistance, *EBME 360, Biomedical Instrumentation Laboratory* 01/2024 – 05/2024
Cleveland, OH

- Graded assignments, quizzes, and exams, ensuring fairness and providing constructive feedback to help students improve.
- Facilitated hands-on lab sessions, demonstrated experimental setups, and ensured adherence to safety protocols.

Skills

Languages
Python, JAVA, MATLAB, C++, C, CUDA

Framework and Libraries
OpenCV, Tensorflow, Scikit-learn, IBMQ, Tensorflow Quantum