Qihua, Gong

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EDUCATION BACKGROUNDS

- **Johns Hopkins University, MD** 08/2021-05/2023

M.S. in Electrical and Computer Engineering GPA: 3.48/4.0

- **University of Missouri-Columbia, MO** 08/2018-05/2021

Bachelor of Electrical Engineering Minor: Mathematics GPA: 3.59/4.0

RESEARCH INTERESTS

- Natural Language Processing.
- Machine learning in signal processing and medical imaging.
- Bioelectrical signal processing and audio signal processing.

WORK EXPERIENCES

1. Tofflon Science and Technology Group Co., Ltd. 07/2023-Present

Position： Software Engineer

- Industrial automation controlling and PLC programming for large lyophilization systems.
- Embedded controlling and programming of small experimental lyophilization machine.
- Maintenance and optimization of production databases.
- Attending innovative research using computer vision to achieve the precise control in pharmaceutical crystalline production.

RESEARCH EXPERIENCES

1. Experimental Setup for Myoelectric Prosthesis Control 05/2022-09/2022

Position： Student Researcher Mentor: Dr. Nitish V. Thakor, Professor of Biomedical Engineering

- Preparing for an upcoming experiment that involves wirelessly transmitting data from electrodes implanted in an animal subject.
- Decoding the animal simulate signals to control a virtual prosthetic.
- Collecting animal simulation data measured from different electrodes, such as 'rest', 'power', 'open', 'pronante', 'supinate'. Use neural network models and machine training to analyze data and discuss in groups and build models that are convenient for future topic analysis.
- Using python and microcontrollers (Arduino) to help with some miscellaneous systems tasks necessary for the experimental setup.

2. Machine Learning in Object Detection 01/2020-05/2021

Position： Student Researcher Mentor: Dr. Dong Xu, Director of Information Technology

- Implemented precision protein cell analytics with object detection.
- Designed a deep learning model with Fast-RCNN network to detect the position of textboxes, arrowheads, and T-bar handles in the cell.
- Implemented a long short-term memory (LSTM) deep learning model-based recognition engine with OCR tools and Tesseract.
- Expanded a small sub-project, utilized a small amount of image data to reduce the recognition and annotation errors in the existing model machine learning through image processing.
- Completed the machine learning and predictive labeling of T-bar and compound in the protein gene model.

PROJECT EXPERIENCES

1. Cervical Spine Fracture Detection with Deep Learning 09/2022-12/2022

Mentor: Dr. Najim Dehak, Associate Professor of Electrical and Computer Engineering

- Preprocessing the skeleton image of each vertebra, masking and doing semantic segmentation, then extracting and separating the slices.
- Developing and testing machine learning models that match the radiologists' performance in detecting and localizing fractures to the seven vertebrae that comprise the cervical spine.
- Predicting a probability for a fracture at each of the seven cervical vertebrae designated as C1, C2, C3, C4, C5, C6 and C7.
- Making 2D and 3D animations of the fracture detection to intuitively display the results.

2. Extending Fragrance Lifetime of Candles through Electromagnetic Induction 08/2020-05/2021

Mentor：Dr. Jae Kwon, Professor of Electrical Engineering & Computer Science

- Developed a novel method to extend candles fragrance lifetime and replace the standard candle warmer.
- Compared Heating methods such as cartridge insertion rods, ceramic heating chambers, and electromagnetic induction.
- Generated heat locally to evenly melt the wax ribbon, and selectively heated the candle wax from top to bottom to mimic a candle melting to release a fragrance as well as extending the lifetime of fragrances.
- Investigated various sensors to determine our best suites.
- Reviewed the potential for Internet of Things (IoT) capabilities for seamless user integration.

3. Architectural Robotics Design 01/2020-05/2020

Mentor：Dr. Marjorie Skubic, Professor and Center Director

- Design the Code program of the robot with Arduino to control the operation of the robot.
- Designed the robot model in 3-D print. Using this design in three projects, windowsill and rotating shaft model, room model and handicapped bedroom model.
- Completed three projects of Auto Light Sensor Curtain, baby house protecting system and Smart bedroom central control with a full grade in three people group.
- Learning of the concept of robot design and understanding of humanity and philosophy thought in design.
- Combined circuit, computer and model building in an interdisciplinary setting. Build and run a complete robot model.

HONORS AND AWARDS

- Dean’s List 12/2018, 04/2019, 12/2019, 04/2020, 12/2020, 04/2021
- Dean’s Scholarship 12/2018, 04/2019, 12/2019, 04/2020, 12/2020, 04/2021

EXTRACURRICULAR ACTIVITIES

- **CSSA at Johns Hopkins University** *Position: Volunteer* 10/2021-05/2023
- **CSSA at University of Missouri-Columbia** *Position: Vice President* 08/2018-05/2021
- **Tutor at Student Success Center** *Position: Student Tutor* 08/2018-05/2021

SKILLS

Software: C, C++, C#, Python, MATLAB.

Hardware: Arduino, Raspberry pi, Circuit design, AutoCAD, OrCAD Pspice.

AI Related: Machine learning, Deep learning, Audio signal process, Medical imaging process, Bioelectric signal process, NLP.