Darasy Reth

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Work Experience

Bose Corporation, Health Division, Boston, MA January 2020 – June 2020
Machine Learning Engineer Co-op

- Led the early stages of battery life estimation research to build an Open Circuit Voltage-based model using State-of-Charge which minimizes the production cost while maintaining the performance of Bose Hearphones.
- Discovered a state-of-the-art and promising method to detect sleep onset based on personalizing parameters.
- Built the amplitude-based model of the respiration waveform of the accelerometer's signal to estimate sleep onset using Hilbert Transform coding in Python.
- Implemented a Close Loop Guided Breathing (CLGB) metric module in Python for measuring breathe adherence of the individual and evaluating CLGB generative content across the testing session.
- Built functions in Python to quantify synchrony between respiration waveform and guided breathing sounds to evaluate how well a person follows the sounds.
- Implemented peak finding algorithm in Python based on Scipy that can deal with noisy data where it adjusts prominence and minimum distance parameters automatically based on respiration rate.
- Built a prototype model in Python for streaming raw chest, accelerometer, and gyroscope signal into the hdf5 file.
- Thoroughly analyzed the methodologies independently and made effective recommendations to project leads.
- Supported various projects simultaneously in both researching and implementing functions that utilized various techniques coded in Java and Python to enable quick and effective processes in running time and space complexity.

Diversiteam, Central Singapore, Singapore May 2019 - August 2019
Machine Learning Engineer Intern

- Led the early stages of backend development of resume parsing and good candidate evaluation platforms.
- Designed machine learning models, Bidirectional Long Short-Term Memory (Bi-LSTM) and Convolutional Neural Networks (CNNs), to identify resume sections and soft skills, achieving positive accuracy rate of 90%.
- Evaluated the importance of features that is useful for collecting data and designing machine learning models for the state-of-the art good candidate identification.
- Developed an image and text recognition system for resume by designing workflow from scratch using machine learning models including Bi-LSTM, CNNs, and NLP techniques in Python.
- Applied researched computer vision technique (OpenCV) and character recognition technology (OCR) to eliminate noises in various resume formats and colors.
- Developed and maintained major features and API templates in Python and C to extract features for resume parsing and good candidate evaluation from MySQL database.
- Optimized algorithms to improve the overall resume parsing performance including both accuracy and speed performance by reducing space and time complexity.
- Implemented a communication platform in Python and PHP between web server and AWS EC2 via FTP and SFTP to launch resume parsing script make the whole process cost effective and scalable.

University at Buffalo, Buffalo, NY
Embedded Sensing and Computing Lab August 2018 – December 2018
Undergraduate Research Assistant

- Built a tool to extract skeleton key points from video surveillance using deep learning and IoT technology.
- Designed a deep learning model in Python to identify and to distinguish fall motion from other human activities with 95% of the positive fall detection rate.
- Evaluated and optimized the model to significantly increase the efficiency of fall detection to compute in real-time by reducing the system's complexity.
- Presented the Fall Detection project and the significance of human skeleton extraction method to the public during the Computer Science Education Week at the University at Buffalo.
- Utilized computer vision technology in Python to analyze human foot parameters including foot length, foot width, foot circumference, heel circumference, toe height, and foot back height.
- Designed algorithms to determine the foot shape of a person using Euclidean distance, circle, and ellipse circumference with at least 90% of the overall correct foot parameters' estimation.

Engineering Intramural Project August 2018 – December 2018

- Designed machine learning models including K-Nearest Neighbors, Random Forest, and Convolutional Neural Networks to analyze unusual human's activities in real-time using Tensorflow and Scikit-Learn.
- Analyzed human motions' data, visualized and interpreted statistical data collected from the models and OPPORTUNITY dataset and recommended an efficient system to Curbell Medical team.
- Led the software team in researching and developing the models to follow the project timeline.

Highlight Course Projects

IoT-Based Indoor Environment Monitoring System September 2020 – Present

- Designed an IoT-based indoor environment monitoring system using two ties, edge tier and cloud tier, design.
- Built a constrained device application (CDA) on the edge tier coding in Python to read temperature, humidity and pressure data through I2C bus, and to activate and deactivate an actuator, HVAC.
- Implementing a gateway device application (GDA) coding in Java to form a connection between cloud services and CDA using MQTT, to perform system and data analysis and management, and to send commands to CDA.
- Designed unit and integrated tests both in Java and Python to ensure that all functionalities are working correctly.

Crime Hunter January 2018 – May 2018

- Led a backend 2D arcade game development coding in JavaScript using PhaserJS gaming engine.
- Designed AI algorithms in JavaScript to have all NPCs changed their acceleration and direction autonomously.
- Optimized overall game performance and stability to work on a low specification computer.

Education

Northeastern University, Boston, MA
Master of Science in Computer Systems Engineering - Internet of Things Expected May 2021
Highlight Coursework: Object Oriented Design, Program Structure and Algorithm, Data Science, Data Networking

State University of New York at Buffalo, Buffalo, NY
Bachelor of Science in Computer Science, Bachelor of Arts in Mathematics December 2018
Highlight Coursework: Algorithms, Machine Learning, Artificial Intelligence, Compiler, Operating Systems, Linear Algebra
* Dean's List * Tau Sigma National Honor Society

Technical Skills

Programming Languages: Python, Java, C, C++, R, PHP
Web Development: JavaScript, HTML
Mobile Application: Android
Database and Cloud Platform: MySQL, Hadoop, AWS EC2
IoT Technologies: MQTT, CoAP, 6LowPAN, Zigbee