

# 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 Headphones.
- 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 to enable quick and effective processes in terms of both 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 to be lower than  $O(n^2)$ .
- 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.

Education

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**Northeastern University**, Boston, MA  
Master of Science in Computer Systems Engineering - Internet of Things Expected May 2021

**State University of New York at Buffalo**, Buffalo, NY  
Bachelor of Science in Computer Science, Bachelor of Arts in Mathematics December 2018  
\* Dean's List \* Tau Sigma National Honor Society

Technical Skills

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