Cara Herbers (Piazza)

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Education

Doctor of Philosophy, Mechanical Engineering
University of Minnesota | Minneapolis, MN
Expected January 2024

Master of Science, Mechanical Engineering
University of Minnesota | Minneapolis, MN
May 2021
GPA: 3.91

Scholarships and Fellowships

National Science Foundation Graduate Research Fellowship
University of Minnesota | June 2021 to Current

Mechanical Engineering Department Fellowship
University of Minnesota | September 2019 to June 2021

Joel Maturi Athletic Full Tuition Scholarship
University of Minnesota | September 2014 to June 2019

Work and Research Experience

Department of Mechanical Engineering, University of Minnesota

Graduate Research Assistant | September 2019 to Current

- Building a wearable health solution to diagnose motor symptoms in Parkinson's disease via pressure sensors, accelerometers, and video data;
- Utilizing signal processing techniques and classical machine learning models to analyze wearable sensor data;
- Championed an IRB submission to collect sensor data from human participants by developing study protocol, collaborating with PIs, and preparing necessary documents such as consent forms and recruitment materials;
- Designed, built, and maintained a data processing pipeline which utilized a novel optimization inverse mapping to extract 3D biomechanical information from single-camera video data;
- Completed statistical analysis in R to determine significant biomechanical signatures of Parkinson's subjects while balancing.

Department of Biomedical Engineering, University of Minnesota

Research Assistant | August 2021 to January 2022

- Launched the development of deep learning models in Python with TensorFlow and Keras which predicted brain axon pathway activation with 98% accuracy based on subject-specific deep brain stimulation (DBS) MRIs;
- Reduced DBS computational model development time by 50% by replacing the work of a supercomputer with deep learning predictive models.

VisionX Corporation

Consultant | January 2021 to January 2022

- Developed algorithms to process human face motion and visualize 3D kinematic signatures while operating in a fast-paced, start-up environment;
- Collaborated with VisionX's CEO, CTO, and lead clinical mentor to understand and implement key user needs to their product.

Coventor: Emergency Ventilator Alternative

Academic Scientific Liaison | May 2020

- Supported the development of the first emergency ventilator alternative to be used in the COVID-19 pandemic which achieved FDA Emergency Use Authorization in 30 days after pandemic onset;
- Communicated with 500 local and global manufacturing companies to identify suppliers;
- Successfully handed off the technology to a consortium of UnitedHealth Group, Boston Scientific, and Medtronic which led to production of 3000 Coventor units to aid in the pandemic.

Leadership Experience

Medical Device Innovation Experience for Undergraduates, University of Minnesota

Lead Program Instructor | January 2019 to Current

- Advising 30 interns on 7 different project teams on innovation and product development;
- Developing and delivering medical device innovation curriculum and lecture material;
- Identifying suitable clinical needs, clinical mentors, and technical mentors for project teams;
- Conducting an engineering education research project surrounding the outcomes of the of innovation curriculum.

Bethel University

Adjunct Professor | September 2021 to January 2022

- Spearheaded and taught a pilot class curriculum focused on the innovation process which was delivered to 20 students and 12 faculty members;
- Facilitated 15 workshops and discussions about integrating the innovation process into the culture of Bethel.

Personal Projects

AZA Trading

Algo Trading Developer | August 2021 to Current

- Building an automated algorithmic cryptocurrency trading strategy framework from scratch in C++ based on historical market data;
- Leveraging Git to collaborate with team members.

Athletics

NCAA Div. 1 Athlete, University of Minnesota
Women's Ice Hockey | September 2014 to June 2018
- Team Captain and 2x National Champion ('15, '16).

USA National Team
Women's Ice Hockey | September 2014 to June 2018

Skills

Programing Languages: Python (TensorFlow, NumPy, Pandas, Scikit-learn, OpenCV etc.), C++, R, MATLAB
Soft Skills: Teamwork, Adaptability, Communication, Self-Starter, Problem Solving, Creativity