

## Ross Brancati

### PhD Candidate

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### Technical Skills

#### Programming Languages:

- Python (advanced – 5+ years)
- Matlab (advanced – 5+ years)
- R (advanced – 3+ years)
- SQL (beginner – 1+ years)
- HTML (beginner – 1+ years)
- Labview (intermediate – 2 years)

#### Data Science:

- Data cleaning and preprocessing
- Data analysis (Pandas, NumPy)
- Signal processing
- Feature extraction and engineering
- Dimensionality reduction (PCA)
- Hypothesis testing
- Regression modeling
- Data visualization (ggplot2, matplotlib, seaborn)
- Machine learning (scikit-learn)
- Deep learning (pytorch, tensorflow)
- ML operations (MLflow, W&B)
- Version control (Git)
- Microsoft Excel

#### Movement Science Research:

- Wearable technology (IMUs, EMG)
- Human subjects research
- Medical imaging (MRI, CT)
- Image processing
- Motion capture (Qualysis, V3D)
- Electromyography (Delsys, BioPac)
- Force Plates (AMTI, Bertec)
- Instrumented treadmills

### Soft Skills

- Communication and presentation
- Teamwork and collaboration
- Adaptable and flexible
- Time management
- Leadership
- Problem-solving
- Interpersonal

### Entrepreneurial Skills

- Customer discovery
- Business model canvas development
- Lean startup methodology
- Pitch deck creation and presentation
- Market and cost analysis

## Education

### University of Massachusetts Amherst

Amherst, MA | August 2020 – Current GPA: 3.93/4.0  
Doctor of Philosophy – Biomechanics and Data Science

### University of Massachusetts Amherst

Amherst, MA | August 2020 – Current GPA: 3.80/4.0  
Graduate Certificate in Statistical and Computational Data Science

### University of Connecticut

Storrs, CT | August 2018 – May 2019 GPA: 3.87/4.0  
Master of Science in Biomedical Engineering (*Biomechanics*)

### University of Connecticut

Storrs, CT | August 2014 – May 2018 GPA: 3.4/4.0  
Bachelor of Science in Biomedical Engineering (*Biomechanics*)

## Research Experience

### Musculoskeletal & Orthopedic Biomechanics Laboratory

University of Massachusetts Amherst | Amherst, MA | August 2020 - Present  
*Research Assistant* | Director: Katherine Boyer, PhD

- Utilize data science approaches such as dimensionality reduction and machine learning to understand relationships between injury and movement.
- Leverage clustering models, domain knowledge, and traditional statistical approaches to identify and characterize subgroups within conditions.
- Developing a system to classify individuals with knee injury into specific phenotypes using wearable sensors available outside of a lab environment.

### Center for Health and Human Performance

University of Massachusetts Amherst | Amherst, MA | May 2023 - Present  
*Data Science Intern* | Director: Michael Busa, PhD

- Creating gait event detection algorithms for a novel smart wearable insole that records signals from pressure and movement sensors.
- Utilize techniques such as data windowing, data reduction, statistical models, and machine learning to develop such algorithms.
- Create high quality visualizations and presentations to translate findings to key stakeholders including startup founders.

### UMass Men's Varsity Ice Hockey Team

University of Massachusetts Amherst | Amherst, MA | May 2022 – January 2023  
*Sports and Data Science Intern* | Supervisor: Brandon Wickett, MS

- Leveraged wearable sensors (Catapult Sports) to assess movement of elite athletes informing coaches and staff of player load and exertion.
- Collected, processed, and analyzed IMU data through various statistical techniques such as regression models and hypothesis testing.

### Orthopedic Research and Biomechanics Lab

University of Michigan | Ann Arbor, MI | May 2019 – August 2020  
*Research Associated 1* | Director: Lindsey Lepley, PhD

- Examined implications of ACL injuries in rodent and human models with various techniques such as biomechanical analysis and imaging.
- Overhauled human biomechanics lab from start to finish including installation and testing of equipment and development of data processing pipelines.

## Entrepreneurial Pursuits

### Gait Guard (Early stage/pre-revenue startup)

*Founder*, January 2023 – Present

- Leading a pre-revenue startup focusing on revolutionizing running related injury detection and treatment with wearable technology and AI.
- Conducting extensive customer discovery interviews to understand user pain points, needs, gaps, and adoption of new technology through ICORPS.
- Developing a prototype with inertial measurement units and deep learning models to identify abnormal movement patterns.
- Working with key collaborators and partners in the startup space and wearable technology industry to secure initial seed funding.