

Ross Brancati, PhD

Human Systems Integration Engineer II

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Skills Summary

- Technical and software:
- Signal processing
 - Supervised machine learning
 - Unsupervised learning (clustering)
 - Time-series analysis
 - Quantitative analysis
 - Dimensionality reduction (PCA)
 - Event detection
 - Statistics
 - Cluster computing
 - Human participants research
 - Biomechanics
- Languages and libraries:
- Python (scikit-learn, pandas, numpy, pytorch, tensorflow)
 - R (ggplot, tidyr, dplyr, plotly)
 - Matlab
 - SQL
- Hardware, sensors, and software:
- Wearable sensors
 - Inertial measurement units
 - Electromyography
 - Motion capture
 - Computer vision (OpenCV)
- Soft skills:
- Analytical thinking
 - Problem solving
 - Communication
 - Teamwork and collaboration
 - Time management
 - Adaptability and flexibility
 - Leadership
 - Prioritization and organization
 - Resilience

Grants and Awards

- IALS Translational Research Fellowship for Grad Students (UMass)
- SPHHS Research Day Award (UMass)
- MCB Outstanding TA Award (UConn)

Certifications

- CITI Human Research (Biomedical)
- CPR

Education

- University of Massachusetts Amherst
Amherst, MA | August 2020 – January 2025
GPA: 3.93/4.0
Doctor of Philosophy – Kinesiology (*Biomechanics*)
- University of Massachusetts Amherst
Amherst, MA | August 2020 – December 2022
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: 3.50/4.0
Bachelor of Science in Biomedical Engineering (*Biomechanics*)

Experience

- Warfighter Systems Integration Lab
Galvion | Portsmouth, NH | January 2025 - Present
Human Systems Integration Engineer II | Lab Manager: Martin Fultot, PhD, PhD
 - Design and implement algorithms for multimodal data synchronization and signal processing (e.g., IMU, eye tracking, motion capture), focusing on time-series feature extraction, event detection, clustering, and classification.
 - Apply mixed methods human factors engineering and user experience research into pre-product exploration and product development lifecycle.
 - Contribute to the development of visual augmentation systems with rigorous scientific research, data science approaches, and ML modeling, integrating heads-up displays to improve soldier situation awareness.
 - Lead the design and execution of human-participant experiments integrating AR/VR systems, motion capture, and multimodal sensor platforms to assess cognitive and physical load associated with advanced soldier-worn systems.
- Musculoskeletal & Orthopedic Biomechanics Laboratory
University of Massachusetts | Amherst, MA | August 2020 – January 2025
Research Assistant | Director: Katherine Boyer, PhD
 - Optimized supervised and unsupervised machine learning models to robustly identify and classify subgroups of runners with distinct injury mechanisms from time-series biomechanical and inertial sensor data.
 - Designed and led human participant experiments focused on collection, processing, and analysis of multimodal physiological data streams.
 - Built research-oriented software tools for signal processing and data science applications such as filtering, feature extraction, and time-series analysis.
- Warfighter Systems Integration Lab
Galvion | Portsmouth, NH | March 2024 – January 2025
Data Science Intern | Lab Manager: Martin Fultot, PhD, PhD
 - Developed a visual-inertial simultaneous localization and mapping (SLAM) algorithm to improve object pose estimation in virtual reality environments.
 - Applied signal processing and statistical techniques to enhance spatial accuracy and temporal stability of objects in immersive simulations.
 - Collaborated with cross-functional engineering and human factors teams to translate research findings into applied solutions for soldier training scenarios.
- Center for Health and Human Performance
University of Massachusetts Amherst | Amherst, MA | May 2023 - February 2024
Data Science Intern | Director: Michael Busa, PhD
 - Developed a gait event detection algorithm for a novel smart wearable insole that records signals from pressure sensors and inertial measurement units.
 - Utilized techniques such as data windowing, data reduction, statistical modeling, and machine learning to optimize algorithms and end-user outputs.
 - Created high quality visualizations and presentations to translate findings to key stakeholders including startup founders and other research scientists.