

SUMMARY

PhD researcher in machine learning for human-robot systems, with four first-author peer-reviewed publications applying deep learning to multimodal time-series sensor data (EMG, IMU, depth vision). Experience spans the full ML lifecycle: feature engineering, model training and rigorous cross-subject validation, and real-time deployment on physical robotic hardware. MS in Computer Science. Seeking an ML/AI research internship building intelligent, safety-critical autonomous systems.

EDUCATION

- PhD in Mechanical Engineering, Human-Robot Collaboration — Santa Clara University

Sep 2025 – Jun 2029

 - Research: ML-driven ergonomic risk prediction, deep learning on wearable sensor data, real-time adaptive robot control
 - Funding: NSF Grant recipient | Conference funding (MSEC, FAIM, ASPIRE, SII) | 4-year full tuition with PhD stipend
- MS in Computer Science & Engineering — Santa Clara University

Jan 2024 – Jun 2025

 - Coursework: AI, Data Mining, Cloud Computing, Algorithms, IoT, Operating Systems
 - Division 1 Student Athlete | NIT National Tournament participant | Highest NCAA ranking in 10 years
- BS in Computer Science — Weber State University

Jan 2020 – Dec 2023

 - Division 1 Tennis Captain | Top 20 most winningest player in WSU history | Louis Moench Scholarship

RESEARCH & EXPERIENCE

- Santa Clara University, ML Research Assistant — Santa Clara, CA

Jun 2025 – Present

 - Applied computer vision (OAK-D depth camera) for posture tracking, fusing kinematic and physiological signals for ergonomic risk classification in human-robot assembly tasks.
 - Trained and benchmarked deep learning and ensemble classifiers (LSTM, LightGBM, Random Forest, SVM) on multimodal EMG/IMU data from 8 muscle sites; achieved up to **89.4% accuracy** under leave-one-subject-out cross-validation and **0.989 AUC** for fatigue-onset detection.
 - Built a real-time sensor streaming and inference pipeline (Delsys wearable sensors → feature extraction → frozen LightGBM model → ROS), enabling a UR3e collaborative robot to adapt its behavior to live predictions of operator state.
 - Engineered time- and frequency-domain feature sets from raw biosignal time series; ran permutation-importance and ablation studies to identify minimal sensor configurations for deployment.
- Kwama (Fintech Startup), Co-Founder & Developer — Johannesburg, South Africa

2025 – Present

 - Co-founded a stablecoin-based (ZARP/USDC) cross-border remittance platform for the Zimbabwe–South Africa corridor; built the mobile app in React Native/Expo with a Supabase backend.
 - Operating in an invite-only SEC Zimbabwe regulatory sandbox, led analytics, customer KYC implementation, regulatory risk analysis (FSCA/SARB/RBZ), and investor/accelerator materials.
- Weber State Financial Services IT, Lead Software Developer — Ogden, UT

Apr 2023 – Dec 2023

 - Developed 4 C#/MySQL applications; built a surplus request portal for 2,500 faculty/staff and an inventory system for 400 users

PUBLICATIONS (FIRST AUTHOR)

S. Buxman, F. Davoudi Kakhki. “Deep Learning–Based Temporal EMG Modeling for Task-Specific Deployment of Passive Exoskeletons in Manufacturing Settings.” **Flexible Automation and Intelligent Manufacturing (FAIM)**, Paris, France, 2026. (in press, Springer LNME)

S. Buxman, et al. “Multimodal Evaluation of Exoskeleton Assistance Using Optimized Machine Learning.” **Human Factors and Ergonomics Society (HFES) Annual Meeting**, 2026. (accepted)

S. Buxman, et al. “Breakpoint Modeling of Surface EMG-Derived Fatigue Onset for Human-Robot Collaborative Assembly Under RULA-Differentiated Postures.” **ASME Manufacturing Science and Engineering Conference (MSEC)**, 2026.

S. Buxman, et al. “Sensor-Driven Strain Detection and Deep Learning Evaluation of Passive Exoskeletons in Industrial Tasks.” **IEEE/SICE International Symposium on System Integration (SII)**, 2026.

TECHNICAL SKILLS

Machine Learning: Deep Learning (LSTM, CNN), Gradient Boosting (LightGBM), Random Forest, SVM, Time-Series Feature Engineering, Cross-Subject Validation (LOSO-CV), Computer Vision, Sensor Fusion

Robotics & Sensing: ROS, UR3e Cobot, Real-Time Inference Pipelines, EMG/IMU Signal Processing, Depth Cameras (OAK-D), Fault Tree Analysis, Human-Robot Collaboration

Programming & Cloud: Python, C++, Java, C#, JavaScript, SQL, Swift | React Native, React.js, Node.js, Flask | AWS (Lambda, DynamoDB, EC2, Amplify), Supabase, Firebase | Spanish (Proficient)