Ben Kadison

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SUMMARY

Aspiring neuroscientist with hands-on experience in computational modeling, wet-lab research, and diagnostics. Conducted award-winning research on predicting Freezing of Gait in Parkinson's disease using wearable sensor data and machine learning, earning a Regeneron Biomedical Science Award and 1st Place at regional competition. First high school intern in Babson Diagnostics history; Experienced in hybrid wet-dry lab environments, independent experimental design, and data-driven research with clinical and industry applications.

RESEARCH EXPERIENCE

Carnegie Mellon — Pittsburgh, PA

Neurotechnology Researcher *Aug 2026 – Current*

(https://beauchamplab.org/)

- Recruited as a Pitt freshman to join Dr. Drew Beauchamp's lab in Biomedical Engineering and the Neuroscience Institute, studying how spinal motoneuron activity relates to upstream cortical and subcortical signaling.
- Analyzing high-density surface EMG signals in MATLAB to decompose motor unit discharge patterns and characterize spinal motoneuron firing behavior.

Babson Diagnostics — Austin, TX

R&D Scientist Intern *May 2025 – Jul 2026*

First high school intern in company history.

(https://betterway.com)

- Analyzed over 700,000 patient samples to build reference ranges for future diagnostic work; reduced assay waste by 20% through process optimization.
- Independently designed and executed experiments across multiple wet-dry lab workstreams, including neuro and testosterone assay development, authoring SOPs along the way.
- Contributed to deliverables for two Fortune 500 companies and supported the data-to-FDA submission pipeline alongside R&D and regulatory teams.
- Researched the Texas Rural Health Transformation Program and its strategic fit for Babson's diagnostic model; findings delivered to the board contributed to a $50K Initiative 1 award, positioning the company for future state contracts. (https://www.medicaid.gov/resources-for-states/rural-health)

Research Fellow — University of Texas at Austin *May 2025 – Jul 2025*

UT High School Research Academy (Selective Admission) • Mentor: Professor Patrick Benfield (https://cns.utexas.edu/directory/patrick-benfield)

- Developed a machine learning framework to predict Freezing of Gait (FoG) in Parkinson's disease several seconds before onset, using tri-axial accelerometer data from wearable sensors and the Daphnet benchmark dataset.
- Engineered 74 biomechanical features including Freeze Index and zero-crossing biomarkers; trained XGBoost, CatBoost, Random Forest, and deep sequence models (LSTM, CNN-LSTM, BiLSTM-Attention) under Leave-One-Subject-Out cross-validation.
- Achieved 90% recall and 82% F1-score with XGBoost, outperforming deep learning baselines; applied SHAP explainability analysis to validate physiologically meaningful predictors of pre-FoG gait instability.
- Presented findings at the Greater Austin Regional Science Fair, earning a Regeneron Biomedical Science Award and 1st Place. Acknowledged as contributor in peer-reviewed publication: British Journal of Multidisciplinary and Advanced Studies (2025).

EDUCATION

University of Pittsburgh — Pittsburgh, PA *Expected May 2030*

B.S. Neuroscience, Bioengineering Minor • Dietrich School of Arts & Sciences, Frederick Honors College

LEADERSHIP & SERVICE

Emergency Community Relief Coordinator — Central Texas Floods *Jul 2025*

- Led a flood relief operation, coordinating logistics, volunteer teams, and thousands of donated supplies for displaced families in Central Texas.

RAC Advocacy Fellow — Washington, D.C. *Dec 2024*

- Co-authored and delivered a legislative advocacy speech to members of Congress on economic equity and social justice policy.

Founder — Kadison Research *2026 – Present*

- Founded a pre-med and biotech mentorship consultancy helping high school students navigate competitive research, internship, and pre-med pathways through personalized strategic advising.

TECHNICAL SKILLS

Computational: Python, Pandas, Matplotlib, Seaborn, Scikit-learn, XGBoost, Data Cleaning & EDA, Time-Series Analysis, Regression Modeling, Feature Engineering, SHAP Explainability

Laboratory: Micropipetting, Gel Electrophoresis, Staining, Assay Development & Optimization, SOP Authoring, Clinical Data Handling, Micro-Sample Diagnostic Testing, Experimental Design

Research: LOSO Cross-Validation, Wearable Sensor Data Processing, Computational Modeling, Scientific Writing & Publication, SHAP Analysis

CERTIFICATIONS

Python for Data Science, AI & Development (IBM, 2025) • Medical Terminology I–III (Rice University, 2024) • Health Information Technology Fundamentals (Johns Hopkins, 2024)

HONORS & AWARDS

Regeneron Biomedical Science Award & 1st Place, Greater Austin Regional Science Fair • HOSA Regional Finalist (Physical Therapy) • RAC Advocacy Fellow • Acknowledged Contributor, British Journal of Multidisciplinary and Advanced Studies (2025)