Aaron Xiong

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Education

University of California, Berkeley *Expected May 2030*
College of Letters & Science | Applied Mathematics & Computer Science

Spring Branch Academic Institute | Houston, TX *May 2026*
GPA: 4.0/4.0 unweighted; 6.5/6.5 weighted | Highest GPA in class
School profile

Experience

Independent Researcher | Machine Learning & Biomechanics

- Developed a 12-channel sEMG residual-fusion model to forecast knee angle **100 ms ahead**; reduced held-out-trial RMSE by **6.8%** (5.093° to 4.748°) across **90 participants**, improving accuracy for 70.
- Built a MuJoCo evaluation of **80 motion windows across 14 checkpoints** (1,120 pairs); used surrogate-signal controls, paired tests, and bootstrapping to analyze prediction accuracy and simulated instability.
- Built a wearable sensing prototype for **under $200** using three sEMG sensors and two IMUs; developed a Transformer with **3.97° test RMSE** and **0.29 ms/sample** GPU inference in a single-participant study.

Host | JINYA Ramen Bar (part-time) *Oct. 2025–Jan. 2026*

Instructor | iCode School Franchise (part-time), Houston, TX *May 2023–Nov. 2025*

Summer Intern | Rice University *May 2023–Aug. 2025*
Secure and Intelligent Micro-Systems (SIMS) Lab | Houston, TX

- Applied SVMs and Lagrange multiplier optimization to wireless communication for biomedical implants; achieved **99.7% validation accuracy**.
- Improved the sequential minimal optimization (SMO) algorithm and added multithreaded training; presented results to faculty and doctoral researchers.

Publications & Manuscripts

Xiong, A. "Toward the use of simulated environments to evaluate sEMG-informed knee-angle prediction: RMSE predicts simulated instability only above a threshold error."
BMC Biomedical Engineering (Springer Nature). **Under review (2 reviewers accepted)** Research Square preprint, Sept. 2026

Xiong, A. "Cost-Effective Prediction of Knee Joint Angle from Surface Electromyography Signals During Free Motion using Transformer Regression."

PennScience — Journal publication
PennScience High School Journal, vol. II, pp. 9–16, 2026. Published article

Research Square — Preprint
Dec. 2025. Research Square preprint

Technical Project

Web DS | JavaScript, HTML/CSS *Feb. 2026*
Source code

- Integrated the Desmond emulator into a responsive web app with dual-screen layouts and mobile touch controls.
- Added save-file import/export, parallel asset loading, progress feedback, and local-file fallback for static hosting.

Honors & Certification

National Merit Finalist *Feb. 2026*
USACO Gold Competitor | USA Computing Olympiad *Jan. 2026*
CompTIA Network+ | Certification *Mar. 2025*
Gold Key (Art) | Scholastic Art & Writing Awards *Jan. 2023*

Visual Art

Art portfolio | Graphite portraiture, charcoal, digital art, and character design.