

Aidan Bradshaw

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Education

Northwestern University, Evanston, IL

September 2025 - Present

- Doctor of Philosophy (Ph.D.) in Computer Science/Machine Learning
- Research Area: Applied ML, Mobile/Ubiquitous Computing, Health Sensing, Embedded Learning, Human Behavior

Carnegie Mellon University, Pittsburgh, PA

(GPA 4.1/4.0) May 2025

- Master of Science in Applied Data Science
- Coursework: Time Series, Applied Linear Models, Text Analysis, Statistical Computing, Statistical Machine Learning

San Diego State University, San Diego, CA

(GPA 3.81/4.0) May 2024

- Bachelor of Science in Computer Science; Minor in Applied Mathematics
- Coursework: Algorithms, Data Structures, Artificial Intelligence, Advanced Programming Languages, Machine Learning

Research Experience

Northwestern University, Chicago, IL

September 2025 – Present

Graduate Student Researcher – SPICE Laboratory

- Developing IMU & vision-based self-supervised/embedded pretraining methods for human activity recognition.
- First-author UIST submission in progress with Google Health and CMU HCII.

Swiss Federal Institute of Technology Zurich (ETH Zurich), Zurich, Switzerland

May 2025 – January 2026

Research Assistant – Integrated Systems Laboratory – Digital Circuits and Systems Group

- First-authored submission to ECCV by developing Muybridge, a zero-shot 2.5D network fusion method for on-device, diffusion-based, center-of-mass estimation using Core ML achieving <300ms inference latency
- Built collaborations that secured funding and access to 3D motion capture data across ETH Zurich (biophysics), University of Graz (physiology), and biomechanical specialist (Germany)

Carnegie Mellon University, Pittsburgh, PA

August 2024 – May 2025

Research Assistant – School of Computer Science - Human Computer Interaction Institute

- First-authored MIDL 2025 short paper proposing a token-wise voxel attribution method for 3D text-to-image diffusion explanations in radiology; co-authored AIES 2025 paper on risks and challenges of GenAI in clinical settings
- Deployed explanation method in OHIF radiology viewer, optimized through U-Net pruning, Locality-Sensitive Hashing (LSH), and post-training quantization to conduct user studies with UPMC medical students, residents, and radiologists

Massachusetts Institute of Technology, Cambridge, MA

May 2024 – November 2024

Visiting Researcher – MIT Media Lab – Responsive Environments Group

- Co-authored submission to *Nature Sensors* on bioacoustics classification of endangered bee species from wing buzz signature using embedded deep learning; collaborators from ETH Zurich, Kioxia, INIBIOMA, and National Geographic
- Architected, compressed and deployed bioacoustics preprocessing/training pipeline and ResNet model on MAX78000 MCU used by National Geographic in field studies through pruning and quantization-aware training

San Diego State Research Foundation, San Diego, CA

March 2023 – August 2024

Human Centered Computing Researcher – Computer Architecture and Systems Laboratory

- First-authored paper on Raynaud's monitoring with wearable sensor fusion; co-authored IEEE Healthcom mHealth paper in collaboration with Yale School of Medicine and Rollins College UK
- Designed and deployed a cross-platform mHealth app for Raynaud's patient studies at Yale, enabling passive sensing (thermal imaging, wearables, environment logging) and initiated an SDSU digital phenotyping collaboration

Publications

Conference Papers

- **Aidan Bradshaw**, Elif Basokur, Marco Giordano, Luca Benini and Christoph Leitner. Muybridge: Quantized 2.5D Network Fusion for On-Device Gait Estimation (Under Review), *ECCV 2026*
- Sawyer J., **Aidan B.**, Ramaz T., Ben S., Shangping R., A Customizable, Real-time Mobile Health Application for Raynaud's Syndrome and Beyond, *IEEE International Conference on E-health Networking, Application & Services (Healthcom) 2025*
- **Aidan B.**, Katelyn M., Arpit M., Weicheng D., Motahhare E., Kayhan B., and Adam P. Toward Interpretable 3D Diffusion in Radiology: Token-Wise Attribution for Text-to-CT Synthesis, *Medical Imaging in Deep Learning Conference (MIDL Short Paper) 2025*.
- Katelyn M., Arpit M., **Aidan B.**, Tom W., Steven L., Afrooz Z., Weicheng D., Kayhan B., Motahhare E., Adam P. A Human-Centered Approach to Identifying Promises, Risks, & Challenges of Text-to-Image Generative AI in Radiology, *Artificial Intelligence in Ethics and Society (AIES) 2025*

- **Aidan B.**, Ramaz T., Shangping R., and Ben S. A Tailored Health Application: Monitoring the Etiology of Raynaud's Disease, (CSCSU) 2024

Journals

- Patrick Chwalek, Marie Kuronaga, Marco Giordano, **Aidan Bradshaw**, Isamar Zhu, Marina Arbetman, and Joseph A. Paradiso. Autonomous Low-Power Distributed Acoustic System for Detecting Endangered *Bombus Dahlbomii* In Suit. (Submitted), *Nature Sensors* 2025

Posters

- Katelyn M., Arpit M., **Aidan B.**, Tom W., Steven L., Afrooz Z., Weichang D., Kayhan B., Motahhare E., Adam P. Opportunities and Challenges in Designing Text-to-Image Generative AI for Medical Education, Training, and Practice *Pitt AI in Healthcare Research Symposium*, 2024

Industry/Teaching Experience

Parsons Corporation, Pittsburgh, PA

January 2025 – May 2025

Artificial Intelligence Consultant

- First-authored internal whitepaper introducing two in-context learning methods: RLHF-based supervised fine-tuning and few-shot synthetic data generation/labeling, resulting in a scalable dataset and labeling pipeline with BERT models
- Applied these methods to create large-scale training data from internal policy documents and fine-tune Microsoft Phi2, achieving 92% classification accuracy on held-out prompts, adopted across the company

AirHop Communications AI, San Diego, CA

June – August 2023

Software Engineer - Startup

- Designed system-level documentation, figures, and software artifacts for the architecture of enhanced self-organizing network (eSON) technology for engineering teams and client use
- Improved OSS engineering workflows by analyzing large-scale network logs to diagnose tower outages, evaluate eSON algorithm performance, and streamline administration sites and user manuals

Carnegie Mellon University, Pittsburgh, PA

August 2024 – May 2025

Teaching Assistant (TA) – Reasoning with Data Course

- Hosted weekly lab sessions and office hours guiding undergraduate statistics students in data analysis and modeling

Awards

- **Murray Scholarship**, Northwestern University, 2025
- **Winner**, Statistical Machine Learning Final Contest (Carnegie Mellon University), 2025
- **Elected to Phi Beta Kappa Honors Society**, (San Diego State University), 2024

Selected Projects | (abradshaw1.github.io)

- **Health Audit-GPT** – Audited small generative transformers (Flan-T5, GPT-Neo, DistilGPT-2) on MedQA/PubMed using red-teaming and cross-attention attribution to expose diagnostic biases and unsafe generations
- **Bayesian Pseudotime Models for Alzheimer's** – Analyzed SEA-AD brain data with bootstrapping and Bayesian inference in Stan, comparing Poisson vs. Negative Binomial models and incorporating APOE genotype

Service

- **Lacrosse (Team Captain)** – SDSU Division 1 Club; national travel teams; 35+ tournaments
- **OCD Support Groups (Facilitator & Group Lead)** – Orange County OCD Support Group, OCD Southern California, Gateway Therapeutic Group, University of Southern California OCD center
- **Volunteer Work** – Someone Cares Soup Kitchen, Aztec Rock Hunger, Breast Cancer Awareness Carnival

Skills/Technologies

- **Machine Learning & AI** – Python, PyTorch, NumPy, Pandas, scikit-learn, W&B, TensorBoard, Xcode
- **Sensing** – IMU, PPG, EEG, 3D motion capture, OpenCV
- **Deployment** – Core ML, ONNX, Analog Devices Toolchains, HPC clusters
- **Programming & Web** – JavaScript, React, React Native, Vite, Vue.js, C/C++/C#
- **Language**: Bilingual Spanish speaker (Colombian nationality) and basic Swiss-German.

Interests

- **Music** – Synthetic pop and electronic (paid DJ at public/private events); self-taught pianist (classical and contemporary)
- **Exotic Coffee Brewing** – Moka pot, espresso, and pour-over methods
- **Logic & Language** – Implicit biases, game theory, paradoxes, and language