Aidan Bradshaw

Zurich, Switzerland | aidanbradshaw@cox.net | 949-238-0695

https://abradshaw1.github.io/ | www.linkedin.com/in/aidan-bradshaw-3a4a181ba/

Education

Northwestern University, *Evanston, IL* *Tentative start September 2026*

- Doctor of Philosophy (Ph.D.) in Computer Science
- Research Area: Ubiquitous Computing, Health Sensing, Behavior Intervention/Prediction, Applied Clinical AI/Interfaces

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

Swiss Federal Institute of Technology Zurich (ETH Zurich), *Zurich, Switzerland* *May 2025 – Present*

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

- First-authored submission to *Nature Sensors* by developing Muybridge, a zero-shot 2.5D network fusion pipeline for on-device gait analysis and Parkinson's disease rehabilitation
- Enabled diffusion-based center-of-mass estimation on iPhones without specialized 3D motion-capture setups by deploying a Core ML–optimized model that achieved <300 ms latency on device for accessible biomechanics analysis.
- 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
- Conducted user studies with medical students, residents, and radiologists from UPMC to evaluate clinical interpretability of the GenAI explanations by integrating attribution overlays in an OHIF radiology viewer
- Enabled model deployment into live clinical workflows at UPMC by reducing inference latency from attention to meet timing requirements from clinician and trainee feedback

Massachusetts Institute of Technology, *Cambridge, MA* *May 2024 – November 2024*

Visiting Researcher – MIT Media Lab – Responsive Environments Group

- Co-Authored submission to *Nature* on bioacoustics classification of endangered bee species from wing buzz signature using embedded deep learning with collaborators from ETH Zurich, Kioxia, INIBIOMA, and National Geographic
- Architected and deployed ResNet model used by National Geographic explorers in the Argentina field studies by pruning, quantization-aware training (INT4/INT8), and structured sparsity to fit MAX78000 SRAM/activation budget
- Created the end-to-end bioacoustics preprocessing and training pipeline, enabling real-time, low-power field deployment for autonomous pollinator monitoring in Patagonia.

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 disease monitoring using wearable multi-sensor fusion; co-authored IEEE Healthcom paper on customizable mHealth applications, in collaboration with Yale School of Medicine and Rollins College UK
- Built/deployed cross-platform mHealth application used by Raynaud's patients consulting with Yale School of Medicine, for passive symptom logging, thermal imaging, wearable sensing, and environment tracking for diagnostic support
- Created collaboration between epidemiology and engineering departments at SDSU launching a digital phenotyping initiative for disease monitoring

Publications

Conference Papers

- **Aidan B.**, Ramaz T., Shangping R., and Ben S. A Tailored Health Application: Monitoring the Etiology of Raynaud's Disease, *CSCSU* 2024
- **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, M*edical Imaging in Deep Learning Conference (MIDL) 2025.*

- Katelyn M., Arpit M., **Aidan B.**, Tom W., Steven L., Afrooz Z., Weichang 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*
- 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 (IEEE Healthcom) 2025*

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 2025*
- **Aidan Bradshaw**, Elif Basokur, Marco Giordano, Luca Benini and Christoph Lietner. Muybridge: Quantized 2.5D Network Fusion for On-Device Gait Estimation (In Preparation), *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 an internal whitepaper on a novel RLHF-based policy reward optimization framework and introduced two methods for in-context synthetic data generation for internal prompt flagging
- Developed a synthetic dataset generation and few-shot labeling pipeline with BERT models for internal policy documents creating large scale training data for supervised fine tuning and reward-based training
- Built and deployed an RLHF pipeline for supervised fine-tuning Microsoft Phi-2, integrating a web-hosted interface for data evaluation and generation achieving 92% classification accuracy on unseen prompts, adopted by company

AirHop Communications AI, *San Diego, CA* *June – August 2023*

Software Engineer - Startup

- Collaborated with the head program manager to design and develop various documentation, figures, and software files on the overall system architecture of enhanced self-organizing network (eSON) technology
- Collected and analyzed data on differences between past and present system components to upgrade and streamline an administration site and User manuals distributed to current clients and OSS (operating support system) engineers
- Analyzed alert logs from large sets of collected data to diagnose tower outages, system breakdowns, data transmission and network algorithm performance and usage

Carnegie Mellon University, *Pittsburgh, PA* *August 2024 – May 2025*

Teaching Assistant (TA) – Reasoning with Data Course

- Hosted weekly lab sessions, office hours and one-on-one meetings in experimental design and sampling methods

Awards

- **Murray Scholarship**, Northwestern University, 2025
- **Winner**, Statistical Machine Learning Final Contest (Carnegie Mellon University, 110+ participants), 2025
- **Best Final Report**, Applied Linear Models (Carnegie Mellon University), 2024
- **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
- **Health & Obesity Analysis** – Modeled global obesity prevalence and caloric intake disparities by country and gender; built dashboards to visualize correlations between diet, BMI-related mortality, and health risks

Service

- **Lacrosse (Team Captain) –** SDSU Division 1 Club; national travel teams
- **OCD Support Groups (Facilitator & Group Lead)** – Orange County OCD Support Group, OCD Southern California, Gateway Therapeutic Group, Unievsity 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 –** Paid DJ at large events; self-taught pianist (classical and contemporary)
- **Logic & Language** – Implicit biases, game theory, paradoxes, and language
- **Exotic Coffee Brewing** – Moka pot, espresso, and pour-over methods