Aidan Bradshaw

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Education

Northwestern University, *Evanston, IL* *September 2025 - Present*

- 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 method for on-device, diffusion-based, center-of-mass estimation using CoreML
- 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
- Facilitated user studies with UPMC medical students, residents, and radiologists by deploying explanations in an OHIF radiology viewer, optimized through U-Net pruning, Locality-Sensitive Hashing (LSH), and post-training quantization

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 bioacoustics preprocessing/training pipeline and ResNet model deployed on constrained MAX78000 MCU by National Geographic explorers in the Argentina 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 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 Short Paper) 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 Sensors 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 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 develop large-scale training data from internal policy documents and fine-tune Microsoft Phi-2, 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, 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; 35+ tournaments
- **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 –** 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