Patrick O'Reilly

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EDUCATION

Northwestern University — **Sep 2020 – Jul 2026**
PhD in Computer Science — *Evanston, IL*

University of Illinois at Chicago — **Jan 2018 – Jun 2020**
MS in Computer Science — *Chicago, IL*

Carleton College — **Sep 2013 – Jun 2017**
BA in Mathematics and Music, Magna Cum Laude — *Northfield, MN*

RESEARCH EXPERIENCE

Massachusetts Institute of Technology — **Sep 2026 – Present**
Tayebati Postdoctoral Fellow, Adv. Anna Huang & Paris Smaragdis

Northwestern University — **Sep 2020 – Jul 2026**
Interactive Audio Lab, Adv. Bryan Pardo

Adobe Inc. — **Mar 2024 – Jun 2024**
Research Internship, Adv. Zeyu Jin

Adobe Inc. — **Sep 2022 – May 2023**
Research Internship, Adv. Zeyu Jin

Descript Inc. — **Jun 2022 – Sep 2022**
Research Internship, Adv. Prem Seetharaman

University of Illinois at Chicago — **Jun 2019 – Sep 2020**
Caterpillar 'CAT' Lab, Adv. Mark Hallenbeck

Carleton College — **Jun 2017 – Aug 2017**
Department of Mathematics, Adv. Rob Thompson

PUBLICATIONS

Peer-Reviewed Conference Papers

- **Patrick O'Reilly**, Saumya Pailwan, Annie Chu, Jason Smith, and Bryan Pardo. D-Composer: Language Modeling for Simultaneous Drum Transcription and Sound Event Decomposition. *Proceedings of the International Society for Music Information Retrieval (ISMIR)*. November 2026.
- **Patrick O'Reilly**, Julia Barnett, Hugo Flores García, Annie Chu, Nathan Pruyne, Prem Seetharaman, and Bryan Pardo. The Rhythm in Anything: Audio-Prompted Drums Generation with Masked Language Modeling. *Proceedings of the International Society for Music Information Retrieval (ISMIR)*. September 2025.
- **Patrick O'Reilly**, Prem Seetharaman, Jiaqi Su, Zeyu Jin, and Bryan Pardo. Code Drift: Towards Idempotent Neural Audio Codecs. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. April 2025.
- Annie Chu, **Patrick O'Reilly**, Julia Barnett, and Bryan Pardo. Text2FX: Harnessing CLAP Embeddings for Text-Guided Audio Effects. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. April 2025.
- **Patrick O'Reilly**, Zeyu Jin, Jiaqi Su, and Bryan Pardo. MaskMark: Robust Neural Watermarking for Real and Synthetic Speech. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. May 2024.

- **Patrick O'Reilly**, Andreas Bugler, Keshav Bhandari, Max Morrison, and Bryan Pardo. VoiceBlock: Privacy through Real-Time Adversarial Attacks with Audio-to-Audio Models. *Neural Information Processing Systems (NeurIPS)*. November 2022.
- **Patrick O'Reilly**, Pranjal Awasthi, Aravindan Vijayaraghavan, and Bryan Pardo. Effective and Inconspicuous Over-the-Air Adversarial Examples with Adaptive Filtering. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. May 2022.
- Ethan Manilow, **Patrick O'Reilly**, Prem Seetharaman, and Bryan Pardo. Unsupervised Source Separation by Steering Pretrained Music Models. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. May 2022.

Peer-Reviewed Workshop Papers

- Julia Barnett, **Patrick O'Reilly**, Jason Brent Smith, Annie Chu, and Bryan Pardo. Ethics Statements in AI Music Papers: The Effective and the Ineffective. *NeurIPS AI4Music Workshop*. December 2025.
- Frank Cwitkowitz, Christodoulos Benetatos, Qixin Deng, Huiran Yu, Nathan Pruyne, **Patrick O'Reilly**, Hugo Flores García, Zhiyao Duan, and Bryan Pardo. HARP 3.0: Generalizing I/O and API Support for Machine Learning in Digital Audio Workstations. *NeurIPS AI4Music Workshop*. December 2025.
- **Patrick O'Reilly**, Zeyu Jin, Jiaqi Su, and Bryan Pardo. Deep Audio Watermarks are Shallow: Limitations of Post-Hoc Watermarking Techniques for Speech. *ICLR Workshop on GenAI Watermarking (WMark@ICLR)*. April 2025.
- Hugo Flores García, Christodoulos Benetatos, **Patrick O'Reilly**, Aldo Aguilar, Zhiyao Duan, and Bryan Pardo. HARP: Bringing Deep Learning to the DAW with Hosted, Asynchronous, Remote Processing. *NeurIPS Workshop on Machine Learning for Creativity and Design*. December 2023.

Peer-Reviewed Demo Abstracts

- **Patrick O'Reilly**, Hugo Flores García, Prem Seetharaman, and Bryan Pardo. Masked Token Modeling for Zero-Shot Anything-to-Drums Conversion. *Extended Abstracts for the Late-Breaking Demo Session of the 25th International Society for Music Information Retrieval Conference*. November 2024.
- Christodoulos Benetatos, Frank Cwitkowitz, Nathan Pruyne, Hugo Flores García, **Patrick O'Reilly**, Zhiyao Duan, and Bryan Pardo. HARP 2.0: Expanding Hosted, Asynchronous, Remote Processing for Deep Learning in the DAW. *Extended Abstracts for the Late-Breaking Demo Session of the 25th International Society for Music Information Retrieval Conference*. November 2024.
- Annie Chu, Hugo Flores García, **Patrick O'Reilly**, and Bryan Pardo. Text2EQ: Human-in-the-Loop Co-Creation Interface for EQ. *Extended Abstracts for the Late-Breaking Demo Session of the 25th International Society for Music Information Retrieval Conference*. November 2024.
- Julia Barnett, William Agnew, Robin Netzorg, **Patrick O'Reilly**, Ezra Awumey, Chris Donahue, and Sauvik Das. Audio Data Defenses: Protecting Music and Speech Data from Targeted Attacks. *Extended Abstracts for the Late-Breaking Demo Session of the 25th International Society for Music Information Retrieval Conference*. November 2024.

INVITED TALKS & TUTORIALS

D-Composer **Nov 2026**
Research presentations at ISMIR oral session, CMU Music AI Reading Group

TRIA: The Rhythm In Anything **Feb 2026**
Research presentation at Dartmouth AI+ Music (DAiM) Reading Group

Five Stages of Grief at the Edge of Automation **Nov 2025 – Apr 2026**
Research presentations at NJIT SInC, NYU MARL, MIT HAI-Res

Tutorial on Speech Watermarking **Aug 2025**
ISCA Interspeech Conference Tutorial

MaskMark: Robust Neural Watermarking for Real and Synthetic Speech **Apr 2024**
ICASSP Session on Watermarking and Data Hiding (Oral)

Adversarial Attacks in the Audio Domain with Adaptive Filtering **Oct 2021**
Bay Innovative Signal Hackers (BISH) Bash

HONORS / AWARDS

Tayebati Postdoctoral Fellowship | *Massachusetts Institute of Technology* **2026**

Best Paper | *International Society for Music Information Retrieval* **2026**

ISMIR Author Grant | *International Society for Music Information Retrieval* **2025**

ICASSP SPS Travel Grant | *IEEE Signal Processing Society* **2025**

NeurIPS Travel Award | *Neural Information Processing Systems* **2022**

Data Science Fellowship | *Northwestern University* **2020**

Cognitive Science Incoming Graduate Fellowship | *Northwestern University* **2020**

TEACHING

Teaching Assistant | *Northwestern University* **Fall 2021 - Spring 2025**
- COMP_SCI 396 Deep Generative Models
- COMP_SCI 349 Machine Learning
- COMP_SCI 396 Deep Learning

Adjunct Lecturer | *Lake Forest College* **Spring 2020**
- CSCI 112 Computer Science I

Teaching Assistant | *University of Illinois at Chicago* **Fall 2019**
- CS 440 Software Engineering

SERVICE

Reviewer **Summer 2023 - Present**
- ICASSP 2025
- ICLR 2024
- ICML 2024, 2025
- InterSpeech 2024, 2025
- ISMIR 2026
- NeurIPS 2023 (top reviewer), 2024, 2025
- TISMIR 2024
- WMark@ICLR 2025