

# PATRICK O'REILLY

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## BIO

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I am a doctoral student in the Department of Computer Science at Northwestern University and a member of the Interactive Audio Lab. My research interests include content provenance and authenticity for generative models, machine learning techniques for controllable audio generation, music information retrieval, and adversarial robustness for audio interfaces.

## EDUCATION

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<b>Northwestern University</b> <i>PhD in Computer Science. GPA 3.92/4.00</i>	<b>Sep 2020 – Present</b> <i>Evanston, IL</i>
<b>University of Illinois at Chicago</b> <i>MS in Computer Science. GPA 4.00/4.00</i>	<b>Jan 2018 – Jun 2020</b> <i>Chicago, IL</i>
<b>Carleton College</b> <i>BA in Mathematics and Music, Magna Cum Laude. GPA 3.91/4.00</i>	<b>Sep 2013 – Jun 2017</b> <i>Northfield, MN</i>

## RESEARCH EXPERIENCE

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<b>Northwestern University</b> <i>Interactive Audio Lab, Adv. Bryan Pardo</i>	<b>Sep 2020 – Present</b>
<b>Adobe Inc.</b> <i>Research Internship, Adv. Zeyu Jin</i>	<b>Mar 2024 – Jun 2024</b>
<b>Adobe Inc.</b> <i>Research Internship, Adv. Zeyu Jin</i>	<b>Sep 2022 – May 2023</b>
<b>Descript Inc.</b> <i>Research Internship, Adv. Prem Seetharaman</i>	<b>Jun 2022 – Sep 2022</b>
<b>University of Illinois at Chicago</b> <i>Caterpillar 'CAT' Lab, Adv. Mark Hallenbeck</i>	<b>Jun 2019 – Sep 2020</b>
<b>Carleton College</b> <i>Department of Mathematics, Adv. Rob Thompson</i>	<b>Jun 2017 – Aug 2017</b>

## PUBLICATIONS

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- **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.
- Hugo Flores Garcia, 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.
- **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.

## PREPRINTS

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- **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)*. <https://arxiv.org/abs/2410.11025>. Under review.
- 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)*. <https://arxiv.org/abs/2409.18847>. Under review.

## TALKS

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<b>MaskMark: Robust Neural Watermarking for Real and Synthetic Speech</b> <i>ICASSP Session on Watermarking and Data Hiding (Oral)</i>	<b>Apr 2024</b>
<b>Adversarial Attacks in the Audio Domain with Adaptive Filtering</b> <i>Bay Innovative Signal Hackers (BISH) Bash</i>	<b>Oct 2021</b>

## AWARDS

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<b>NeurIPS Travel Award</b>   <i>Neural Information Processing Systems</i>	<b>2022</b>
<b>Data Science Fellowship</b>   <i>Northwestern University</i>	<b>2020</b>
<b>Cognitive Science Incoming Graduate Fellowship</b>   <i>Northwestern University</i>	<b>2020</b>
<b>Phi Beta Kappa</b>   <i>Carleton College</i>	<b>2017</b>
<b>Honors in Music Performance</b>   <i>Carleton College</i>	<b>2017</b>
<b>Distinction in Comprehensive Exercise in Music</b>   <i>Carleton College</i>	<b>2017</b>

## TEACHING / SERVICE

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<b>Teaching Assistant</b>   <i>Northwestern University</i>	<b>Fall 2021 - Spring 2023</b>
<ul style="list-style-type: none"><li>• COMP_SCI 396 Deep Generative Models</li><li>• COMP_SCI 349 Machine Learning</li><li>• COMP_SCI 396 Deep Learning</li></ul>	
<b>Adjunct Lecturer</b>   <i>Lake Forest College</i>	<b>Spring 2020</b>
<ul style="list-style-type: none"><li>• CSCI 112 Computer Science I</li></ul>	
<b>Teaching Assistant</b>   <i>University of Illinois at Chicago</i>	<b>Fall 2019</b>
<ul style="list-style-type: none"><li>• CS 440 Software Engineering</li></ul>	
<b>Reviewer</b>	<b>Summer 2023 - Present</b>
<ul style="list-style-type: none"><li>• NeurIPS 2023 (top reviewer), 2024</li><li>• ICLR 2024</li><li>• ICML 2024</li><li>• InterSpeech 2024</li><li>• ICASSP 2025</li><li>• TISMIR 2024</li></ul>	