

# YAHIR HERNANDEZ

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## EDUCATION

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**Massachusetts Institute of Technology** – Cambridge, MA

May 2026

*Bachelor of Science in **Computer Science & Engineering** and in **Music***

GPA: 4.4

**Music Tech Courses:** Fundamentals of Music Processing, Interactive Music Systems, Intro To Music Tech

**AI & ML Courses:** Intro to Deep Learning, Advances in Computer Vision, Intro to Machine Learning, Linear Algebra

**CS Courses:** Data Structures & Algorithms, Software Construction, Software Design, Computer Systems Engineering

## SKILLS

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**Programming Languages:** Python, JavaScript, TypeScript, C, C#, Java, Assembly, HTML, CSS, BluespecSV

**Libraries & Tools:** Librosa, Torchaudio, Tone.js, NexusUI, pretty\_midi, PyTorch, NumPy, SciPy, Matplotlib, Git

## WORK EXPERIENCE

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**Collaborative Music Lab** – MIT - Cambridge, MA

Oct 2025 – Present

*Music Tech Researcher*

- Enabled collaborative music-making across varying musical ability levels by engineering modular, real-time input features in the Creativitas live coding environment, supporting 3 interaction modes: MIDI, sensor-based, & touch
- Implemented reusable musical prototypes; documented components for future research and public-facing deployment
- Corroborated hypotheses of viable collaborative music systems by testing with a cohort of research assistants, incorporating feedback and criticism while researching current practices in collaborative music experiences.

**Time-line** – Remote

Aug 2025 – Present

*Machine Learning Engineer*

- Spearheaded exploratory data analysis on over 400 tracks, quantifying section-length patterns, drop-detections, pre/fake-drop rates to create reliable drop estimation when model analysis is unavailable.
- Co-developed end-to-end pipeline for the beat-aligned drop-detection model. Refined per-beat features & multi-scale windows, and designed expanded beat-level features.
- Analyzed integration of possible drop-detection features and new optimal audio representations for music analysis.

**Studio Wedge** – Remote - Chicago, IL

Jun 2025 – Present

*Lead Software Engineer*

- Led the initiative to outline the programming implementation timeline and integration of LLMs in the studio's game design framework for streamlined development and personalized debugging in scripting.
- Developed a first-pass model of an enemy path-finding ML model to target players, achieving a ~20% performance increase versus randomized path search during testing. Prototyped ideas for a generative music model for playtesting.
- Implemented core gameplay mechanics in Unity: state machines, collision systems, and modular controller scripts.

**Autonomy and Embedded Robotics Accelerated (AERA) Lab** – MIT - Cambridge, MA

Sep 2023 - Present

*Machine Learning Researcher*

- Designed a VR framework for human-robot teaming in Unity that leverages human-gaze as an attention-aware modality for collaborative audio event localization.
- Corroborated hypothesis of human-gaze as a useful communication channel with performance improvement of ~19%

## PROJECTS

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**Gaze as Attention-Aware Modality for Audio Event Localization** - Project, Paper

Sep 2025

- Built a gaze-guided SELD pipeline: synthesized a virtual ambisonic cardioid & a training-free DOA prior, improving performance on F20 and DOA-MAE without retraining by about 9% and 18% respectively.
- Developed real-time VR environment (Unity) with gaze rays, steerable beamformer, & audio foveation; ran ablations.

**Visually Indicated Music** - Project, Paper

May 2025

- Designed a CNN+LSTM pipeline with MIDI-auxiliary stream to synthesize instrument audio from silent video, tested on URMP dataset; cut log-mel spectrogram error by >50% & reached nearly 50% pitch-detection accuracy
- Built an offline preprocessing + sliding-window inference stack that made training 12× faster on NVIDIA RTX 4060

## LEADERSHIP

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**Flipping Failure** – MIT

2023 – 2025

*Undergraduate Ambassador*

- Facilitated discussions with grad students, counselors, and professors on reframing the perspective of failure at MIT.
- Collaborated with MIT's Teaching + Learning Lab, expanding student video story submissions and supporting storytelling workshops that reframe academic setbacks as opportunities for growth.