CHRISTOPHER R. LANDSCHOOT

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SUMMARY

Machine Learning Engineer & Researcher specializing in audio, music, and signal processing. Experienced in leading the development of scalable deep learning systems from ground-up research to production, including source separation, sound event detection, and generative audio tasks. Proven record of pioneering and translating AI innovation into commercially deployed technologies that power core products and drive multi-million-dollar annual recurring revenue.

SKILLS

Programming	Python, PyTorch, TensorFlow, Lightning, Keras, Scikit-learn, NumPy, Pandas, C++, SQL, MATLAB, Jupyter, Max/MSP/RNBO, Git, W&B, Neptune, Docker, Modal, AWS, GCP, Spat (IRCAM), JUCE
Technical	Machine Learning & Deep Learning, Digital Signal Processing, Model Training & Optimization, Audio Algorithm Development, Data Collection & Curation, Audio Data Engineering, Model Deployment & MLOps, Acoustics & Psychoacoustics, Project Management, Technical Writing
Music & Audio	Pro Tools, Audacity, Composing, Performing, Recording, Producing, Mixing, Mastering, Electric & Acoustic Guitar, Bass Guitar, Piano, Percussion, Vocals, Banjo

EXPERIENCE

Output

Machine Learning Research Engineer — *December 2025 – Present*

- Developing novel machine learning technologies to unlock new creative possibilities for musicians, producers, and creators.

Whitebalance

Machine Learning Engineer — *August 2023 – December 2025*

- Led end-to-end research and development of state-of-the-art deep learning systems for audio source separation, sound event detection, zero-shot classification, music fingerprinting, and audio enhancement, taking ML technologies from MVP to industry-leading performance that fueled multi-million-dollar annual recurring revenue growth.
- Advanced core product technology by designing and innovating cutting-edge machine learning frameworks in PyTorch, novel model architectures, scalable system designs, and optimized production pipelines, improving performance and inference speed while reducing model sizes by over 90%.
- Created and curated extensive proprietary audio datasets, developed semi-automated labeling tools that ensure high-quality annotations, and leveraged advanced data augmentation techniques to synthetically scale data by over 10x to improve model robustness and generalization.

Virtuel Works

Advisor — *August 2023 – Present*

Audio Research Collaborator — *August 2022 – August 2023*

- Collaborated on implementing a real-time binaural externalization algorithm for object-based spatial audio in Max/MSP and RNBO, improving frontal elevation perception while minimizing spectral coloration via an all-pass framework.

Threshold Acoustics

Acoustics Consultant — *March 2020 – January 2023*

- Developed proprietary software collaboratively with a research team in MATLAB to model wave behavior via the finite-difference time-domain method, producing a new company tool for precise acoustic diffusion analysis.
- Delivered a wide range of successful projects, including performing arts, education, civic, worship, experimental, corporate, residential, and environmental, by managing project teams, timelines, and budgets effectively.

Kirkegaard Associates

Audio and Acoustics Specialist — *August 2018 – March 2020*

- Launched a new product offering by developing a room acoustics auralization system in Max/MSP and MATLAB that can encode, convolve, and decode higher-order ambisonic signals in real-time.

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Rensselaer Polytechnic Institute
Research Assistant *August 2017 – August 2018*

- Researched and patented new technology, by creating a novel machine learning algorithm in MATLAB that estimates the directions of arrival and relative levels of an arbitrary number of sound sources through a multi-level Bayesian framework, using spherical beamforming with a spherical microphone array.

OPEN-SOURCE PROJECTS

Tiny Audio Diffusion
- Implemented a lightweight waveform-based diffusion system to generate high-resolution 44.1kHz short audio samples capable of being trained and run on a single low-level consumer GPU with less than 2GB of VRAM.

LogWMSE (PyTorch)
- Developed a PyTorch implementation of logWMSE, an audio quality metric and loss function that addresses issues in common metrics, like digital silence targets, making it ideal for training and evaluating audio separation models.

Music "Demixing" with Band-Split Recurrent Neural Network
- Built an audio source separation system in Python using a band-split recurrent neural network framework that was trained via a GCP pipeline with W&B tracking, to compete in the Sound Demixing Challenge 2023, resulting in an improvement over the baseline model by 42%. Separated sources: voice, bass, drums, other.

EDUCATION

Data Science Immersive *January 2023 – April 2023*
General Assembly

Master of Science, Acoustics *August 2017 – August 2018*
Rensselaer Polytechnic Institute GPA: 4.00/4.00
Graduate Researcher

Bachelor of Science, Mechanical Engineering *August 2012 – May 2016*
University at Buffalo, The State University of New York GPA: 3.50/4.00
Minor: Music Performance, Guitar

PUBLICATIONS

Jot, J.; Landschoot, C.; Lukin, A. Binaural Externalization Processing - from Stereo to Object-Based Audio. The Journal of the Audio Engineering Society. 2022; Express Paper 56.

Landschoot, C.; Xiang, N. Model-based Bayesian Direction of Arrival Analysis for Sound Sources Using a Spherical Microphone Array. The Journal of the Acoustical Society of America. 2019; 146, 4936. DOI: 10.1121/1.5138126.

Xiang, N.; Landschoot, C. Bayesian Inference for Acoustic Direction of Arrival Analysis Using Spherical Harmonics. Entropy 2019, 21, 579. DOI: 10.3390/e21060579.

PATENTS

Xiang, N.; Bush, D.; Landschoot, C. 2025. Sound Source Enumeration and Direction of Arrival Estimation Using a Bayesian Framework. US 12,386,007 B2, issued Aug 12, 2025.

LEADERSHIP

Acoustical Society of America
Vice Chair, Chicago Regional Chapter *May 2019 – Present*