LELAND HENRY, CTS

Audio and Acoustics Engineer | Digital Signal Processing | www.lelandhenry.com

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PROFESSIONAL SUMMARY

Audio and acoustics engineer with 10+ years in professional audio and AV systems, combining acoustic measurement, system tuning, critical listening, digital signal processing, and Python development. Current work spans acoustic research at Dolby Laboratories and audio quality evaluation for ElevenLabs Productions. Project experience includes source localization, beamforming, python based AI/ML workflows, equalization, room impulse response analysis, speech-recognition model adaptation in PyTorch, and C++/JUCE audio prototyping.

PROFESSIONAL EXPERIENCE

Dolby Laboratories: Graduate Research Intern - Acoustic Data Research
SEPTEMBER 2026 - PRESENT - SAN FRANCISCO, CA

- Develop research workflows supporting continued improvement of Dolby products, including Dolby Atmos FlexConnect.
- Build Python based tools for acoustic simulation, room configuration, and room impulse response analysis. Use a wide variety of SDKs and platforms such as Treble, Smaart, Klippel, and Matlab.
- Design controlled validation experiments using room geometry, source and receiver positions, first-arrival timing, and reverberation behavior to identify modeling errors.
- Contribute to technical documentation and manuscript preparation on spatial room capture and physics-based acoustic simulation.
- Research new Beam-Forming, Microphone Array Processing, and Acoustical Measurement Techniques

ElevenLabs: Audio Engineer, Contract
MAY 2026 - PRESENT - SAN FRANCISCO, CA

- Evaluate audio recordings and provide quality assessments for the ElevenLabs Productions team.

ME Engineers: Project Engineer - Audio/Acoustics
JULY 2025 - SEPTEMBER 2026 - GOLDEN, CO

- Designed and modeled sound systems for stadiums, arenas, universities, and performance venues, evaluating coverage, sound pressure level, directivity, speech intelligibility, and loudspeaker placement.
- Developed Python automation and validation tools for equipment verification, engineering-data analysis, and acoustic-model review, identifying outliers and inconsistencies.
- Collaborated with acoustics, AV, electrical, mechanical, and architectural teams to resolve design constraints and communicate findings through models, drawings, and technical presentations.

The Werd Company: A/V Designer & Programmer
JANUARY 2023 - JULY 2025 - AUSTIN TX

- Designed, programmed, commissioned, and troubleshot audio, DSP, control, and networked AV systems across retail, hospitality, worship, and performance environments.
- Performed acoustic measurements, system tuning, signal-flow analysis, DSP configuration, and root-cause troubleshooting.
- Developed AV designs, control interfaces, and deployment workflows for more than 30 YETI retail locations across North America, with ongoing technical support.

Audio Engineer/Systems Engineer
CHICAGO, IL / AUSTIN, TX/HOUSTON, TX | 2014 – 2023

- Worked across live sound and recording, including front-of-house mixing, loudspeaker and microphone systems, RF, gain structure, multi-band compression, equalization, and system troubleshooting.
- Applied critical listening and acoustic measurement to support audio quality across varied rooms and production environments.

TECHNICAL SKILLS

- **Acoustics and Measurement:** Room acoustics, acoustic measurement, room impulse response analysis, sound-system tuning, speech intelligibility, simulation validation, and audio hardware/software troubleshooting. Smaart, REW, Klippel, Treble SDK, EASE, Soundvision, and pyroomacoustics.
- **Digital Signal Processing:** FFT, STFT, windowing, spectral analysis, filtering, equalization, convolution, RMS measurement, signal flow, and critical listening. Foundational knowledge of microphone arrays, beamforming, direction-of-arrival estimation, TDOA, GCC-PHAT, and SRP-PHAT.
- **Programming and Prototyping:** Python, NumPy, SciPy, pandas, librosa, Jupyter, Git/GitHub, JSON, and REST APIs. C++ working familiarity through JUCE/VST3 prototyping; MATLAB introductory exposure; Swift/SwiftUI fundamentals.
- **Audio Machine Learning:** AI Software Development, Agentic Workflows, PyTorch project experience, LoRA adaptation, automatic speech recognition, TensorFlow/Keras, scikit-learn, regression, classification, cross-validation, and model evaluation.
- **Audio Production and Systems:** Logic Pro, Pro Tools, Dolby Atmos mixing, Q-SYS, Dante, microphone and loudspeaker systems, and networked audio. Max/MSP familiarity.

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SELECTED RESEARCH & PROJECTS

Spatial Room Capture to Acoustic Simulation (ARApp)

ARKIT, ROOMPLAN, TREBLE SDK, PYTHON, SWIFT/SWIFTUI

- Developed workflows connecting ARKit and RoomPlan room capture with Treble acoustic simulation to investigate how room geometry and device placement affect acoustic behavior.
- Built Python tools to configure room geometry, acoustic materials, and source and receiver positions, and analyze simulated room impulse responses.
- Designed controlled validation experiments using first-arrival timing and reverberation behavior to identify modeling errors and check simulation results.

Labrador - Speech Recognition Model and LoRA Adaptation

ONGOING INDEPENDENT PROJECT | PYTORCH | LORA | FFSAR MODELING| TRAINING AND EVALUATION

- Develop and evaluate LoRA adaptations for Labrador, an ongoing speech-recognition project, using PyTorch and iterative training experiments.
- Compare successive model versions against defined development criteria to identify performance gaps and guide further training and dataset improvements.

ChordDetectLite

C++ | JUCE | VST3 | FFT | REAL-TIME AUDIO

- Built a guitar-analysis learning prototype with audio pass-through, mono summing, RMS measurement, Hann-windowed FFT analysis, and peak-frequency estimation.
- Compiled and debugged the plugin to gain practical experience with C++ and real-time audio processing.

AI-Assisted Spectral Pre-Conditioning for Live Sound Mixing

PYTHON | STFT | DSP | CNN/FFN| EXPERIMENTAL DESIGN | PERCEPTUAL EVALUATION

- Developed an audio-analysis pipeline using STFT-derived features, normalized spectral-band energy, crest factor, and track-aware descriptors to investigate perceptually relevant mixing problems.
- Designed evaluation protocols around Time-to-Acceptable-Mix, repeated baselines, interaction logging, and independent listening assessments.

Machine Learning for Loudspeaker Array Placement

PYTHON | SCIKIT-LEARN | RANDOM FOREST REGRESSION | STREAMLIT

- Developed a proof-of-concept ML workflow relating room geometry to loudspeaker-array configuration, including splay angles and azimuth.
- Generated structured synthetic loudspeaker-placement datasets and trained regression models to predict candidate system configurations.
- Evaluated model performance using RMSE and investigated the impact of dataset variation and parameter distributions.
- Deployed an interactive Streamlit prototype through Hugging Face Spaces.

EDUCATION

M.Sc. Artificial Intelligence & Machine Learning - Montpellier School of Business (Online, In Progress)
2026 – Present | Expected 2028
Relevant study: Machine Learning, Deep Learning, Statistics, Time Series, Computer Vision, Optimization, Convolutional Neural Networks, Data Analysis
Postgraduate Program, Artificial Intelligence & Machine Learning
University of Texas at Austin | 2025
GPA: 4.09
B.A. Audio Arts & Acoustics
Columbia College Chicago | 2021
Concentration: Live & Installed Sound - Magna Cum Laude

RESEARCH INTERESTS

Spatial Audio | Acoustic Scene Understanding | Room-Aware AI | Source Localization | Microphone Arrays | Acoustic Simulation | Simulation-to-Reality | Computational Acoustics | Perceptual Audio | Live Sound | Human-Centered Audio AI | Intelligent Audio Systems

PUBLICATIONS & TECHNICAL WRITING

- Henry, L. Reducing Cognitive Search in Live Sound Mixing via AI-Assisted Spectral Pre-Conditioning. Submitted to ISMIR 2026.
- Spatial Room Capture and Physics-Based Acoustic Simulation: Technical manuscript in preparation, Dolby Laboratories Advanced Technology Group, 2026.

CERTIFICATIONS

CTS, AVIXA
Dante Certification Levels 1–3
L-Acoustics Soundvision
L-Acoustics Variable Curvature Line Source
Q-SYS Level 1
Netgear ProAV Level 1
Ubiquiti certifications