Yue Qiao

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Education

Princeton University — Princeton, NJ
M.A. & Ph.D., Mechanical and Aerospace Engineering — *Expected 2024*
Advisor: Edgar Choueiri

Penn State University — University Park, PA
Graduate program in Acoustics (Distance Education, non-degree seeking) — *2020*

Peking University — Beijing, China
B.S., Physics — *2019*
Minor in Theory and History of Arts (Musicology oriented)

Hong Kong University of Science and Technology — Hong Kong SAR
Exchange program at School of Science — *2017*

Research Experience

3-D Audio and Applied Acoustics (3D3A) Laboratory, Princeton University — Princeton, NJ
Assistant in Research, advisor: Edgar Choueiri — *2019-Present*
• Working on robust personal sound zone reproduction with head tracking, combining both machine learning-based and traditional DSP-based approaches.
• Past projects: head-tracked loudspeaker beamforming (sponsored by Focal), sound stage control in automotive cabins (sponsored by Tesla).

Reality Labs, Meta — Sunnyvale, CA
Research Engineer Intern, manager: Pablo F. Hoffmann — *May-Aug 2022*
• Developed machine-learning-based models for spatial audio quality evaluation.

Speech and Hearing Research Center (SHRC), Peking University — Beijing, China
Undergraduate Research Assistant, advisor: Tianshu Qu — *2018 - 2019*
• Worked on building a spherical microphone array for sound field recording and implementing its encoding and decoding system in higher-order Ambisonics.

Center for Computer Research in Music and Acoustics (CCRMA), Stanford University — Palo Alto, CA
Undergraduate Visiting Research Intern, advisor: Fernando Lopez-Lezcano, Chris Chafe — *Jul-Sep 2018*
• Worked on interactive musical performance with spatial audio in higher-order Ambisonics and physical modeling of sound objects using Leap Motion for hand gesture control.

Skills and Interests

- **Programming**: MATLAB, Python, C++ (JUCE), Max/MSP, Plogue Bidule, SuperCollider, LaTeX
- **Spatial Audio**: Personal Sound Zones, Ambisonics, Head-Tracked Rendering, Beamforming
- **Other Audio-related**: Acoustic Simulation & Measurement, Perceptual Listening Test Design, VST Plugin Development, Psychoacoustics, Room Acoustics
- **Scientific Skills**: Deep Learning (Pytorch/Tensorflow), Digital Signal Processing, Machine Learning, Numerical Methods, Convex Optimization, Statistics, Physical Modeling
- **Music**: Piano, Guitar, Electronic Music, Music Production, Binaural/Field Recording
- **Research Interests**: Spatial Audio Reproduction, Sound Field Control, AI-based Audio Processing

Selected Awards and Honors

- **AES Educational Foundation Scholarship Recognition** *Aug 2023*
- **Best Student Paper Award** at the 152nd AES Convention *May 2022*
- **Weiming Physics Students Fellowship**, Peking University *2018*
- **Award for Scientific Research**, Peking University *2017*
- **Bronze Medal** in the 31^{st} Chinese Physics Olympiad *2014*
- **1^{st} Prize** in Chinese Mathematics Olympiad, Gansu Province *2014*

Selected Publications

Yue Qiao and Edgar Choueiri. "Neural Modeling and Interpolation of Binaural Room Impulse Responses with Head Tracking", in *Audio Engineering Society Convention 155*. New York, USA, 2023.

Yue Qiao and Edgar Choueiri. "Performance Optimization of Personal Sound Zones with Crosstalk Cancellation", in *2023 Immersive and 3D Audio: from Architecture to Automotive (I3DA)*. Bologna, Italy, 2023.

(In Press) **Yue Qiao** and Edgar Choueiri. "The Effects of Individualized Binaural Room Transfer Functions for Personal Sound Zones", *Journal of the Audio Engineering Society*, 2023.

Yue Qiao and Edgar Choueiri. "Optimal Spatial Sampling of Plant Transfer Functions for Head-Tracked Personal Sound Zones", in *Audio Engineering Society Convention 154*. Espoo, Finland, 2023.

Yue Qiao, Léo Guadagnin, and Edgar Choueiri. "Isolation performance metrics for personal sound zone reproduction systems", JASA Express Letters, 2022.

Yue Qiao, Nick Zacharov, and Pablo F. Hoffmann. "Prediction of Timbral and Spatial Audio Quality with Independent Auditory Feature Mapping", in *Audio Engineering Society Convention 153*. Online, 2022.

Yue Qiao and Edgar Choueiri. "The Performance of A Personal Sound Zone System with Generic and Individualized Binaural Room Transfer Functions", in *Audio Engineering Society Convention 152*. Online, 2022.

Yue Qiao and Edgar Choueiri. "Real-time Implementation of the Spectral Division Method for Binaural Personal Audio Delivery with Head Tracking." in *Audio Engineering Society Convention 151*. Online, 2021.

Mengfan Zhang, **Yue Qiao**, Xihong Wu, and Tianshu Qu. "Distance-Dependent Modeling of Head-Related Transfer Functions." in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. Brighton, UK, 2019.

Zhongshu Ge, **Yue Qiao**, Shusen Wang, Xihong Wu, and Tianshu Qu. "Subjective Evaluation of Virtual Room Auralization System based on the Ambisonics Matching Projection Decoding Method", in *Audio Engineering Society Convention 145*. New York, NY, USA, 2018.

Tianshu Qu, Zhichao Huang, **Yue Qiao**, and Xihong Wu. "Matching Projection Decoding Method for Ambisonics System", in IEEE *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. Calgary, Alberta, Canada, 2018.