

# Yue Qiao

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## Education

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**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

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**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

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- **Programming:** MATLAB, Python, C++ (JUICE), Max/MSP, Plogue Bidule, SuperCollider, L<sup>A</sup>T<sub>E</sub>X
- **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

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- **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<sup>st</sup> Chinese Physics Olympiad 2014
- **1<sup>st</sup> Prize** in Chinese Mathematics Olympiad, Gansu Province 2014

## Selected Publications

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(Under Review) **Yue Qiao**, Jessica Luo, and Edgar Choueiri. "Spatial Sampling of Binaural Room Transfer Functions for Head-Tracked Personal Sound Zones", *Journal of the Audio Engineering Society*, 2023.

**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.

**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.