

Xiaoyu Niu

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EDUCATION

The University of Texas at Austin

Ph.D. Candidate, *Elmer L. Hixson Endowed Ph.D. student in Engineering Acoustics*

Track of Electromagnetic & Acoustics

Chandra Department of Electrical and Computer Engineering

Supervisor: *Neal A. Hall*

Austin, TX

Aug. 2020 - Jun. 2025

Chinese Academy of Sciences

Institute of Acoustics

Supervisor: *Xiaodong Li*

Beijing, China

Aug. 2019 - Jun. 2020

Ocean University of China

B.S. in Underwater Acoustics, GPA:3.9, Rank: 1/81

Qingdao, China

Aug. 2015 - Jun. 2019

HONORS & AWARDS

- Invited TEDx Talker March 2023
Can You Hear Me Now? Directional Loudspeakers and Its Longhorn Dreamers
- Best Paper Award, Society for Experimental Mechanics Feb. 2023
Measurement of Airborne Ultrasound Using Laser Doppler Vibrometry
- Best Paper Award, Acoustical Society of America Jan. 2023
MEMS Microphones as Ultrasonics Transducers
- Elmer L. Hixson Endowed Graduate Fellowship in Acoustics Engineering, the University of Texas at Austin 2023
- Elmer L. Hixson Endowed Graduate Fellowship in Acoustics Engineering, the University of Texas at Austin 2022
- Elmer L. Hixson Endowed Graduate Fellowship in Acoustics Engineering, the University of Texas at Austin 2021
- Wen Yuan Scholarship Ocean University of China
The highest Honor in the university awarded to the top 3 students
- Excellent Student Model Medal Ocean University of China
Awarded to the top 10 students in the university
- Provincial Outstanding Graduates Shandong Province
Awarded to the top 20 students in the university
- National Scholarship Ministry of Education of the People's Republic of China
Awarded to the top 1 student in the department
- May Fourth Excellent Youth Medal Ocean University of China
Awarded to the top 3 undergrad students in the university
- Chunhua Scholarship Ocean University of China
Awarded to the top 10 undergrad students in the university
- National Bronze Award Ministry of Education of the People's Republic of China
"Internet+" National Innovation and Entrepreneurship Competition
- National Scholarship Ministry of Education of the People's Republic of China
Awarded to the top 1 student in the department
- National Scholarship Ministry of Education of the People's Republic of China
Awarded to the top 1 student in the department

PATENTS

1. *Directional MEMS microphone for automotive calling applications*. Application number:0000-0000, Filed:08/04/2023, Inventors: Xiaoyu Niu, Bichoy Bhar, Udit Rawat
2. *Calibration method using acoustic reflection catheter phase calibration system*. Application number: CN106949921B, Issued:01/29/2019, Inventors: Xiaoyu Niu, Kai Wu, Xin Zhang
3. *stoma electronic bowel*. Application number: CN108814794A, Issued: 11/16/2018, Inventors: S. Fu, J. Ma, R. Tang, L. Han, Y. Sun, Y. Liu, S. Geng, Z. Ma, X. Xiao, C. Chang, Xiaoyu Niu, X. Qiu
4. *Programmable wavefront control device*. Application number: CN106898344A, Issued: 03/22/2017, Inventors: Xiaoyu Niu, Kai Wu, Xin Zhang
5. *A double-layer packaging bag*. Application number: CN205366600U, Issued: 07/06/2016, Inventor: Xiaoyu Niu

PUBLICATIONS

1. "Measurement of Airborne Ultrasound Using Laser Doppler Vibrometry ", Z. Liu, Xiaoyu Niu, Y. Meng, E. Vatankhah, D. Kim, N. Hall, *Computer Vision and Laser Doppler Vibrometry*, Conference Proceedings of the Society for Experimental Mechanics Series, Accepted (2023)
2. "Magnetoelastic Vibration Sensors", E. Vatankhah, C. Hodges, Xiaoyu Niu, Z. Liu, Y. Meng, A. Belyakov, N. Hall, *Sensors & Instrumentation and Aircraft/Aerospace Testing Techniques*, Conference Proceedings of the Society for Experimental Mechanics Series, Accepted (2023), DOI: 10.1007/978-3-031-34938-6_4
3. "State-State Modelling of Nonlinear Electrostatic Transducers and Experimental Characterization Using LDV", Xiaoyu Niu, Y. Meng, R. Williams, E. Vatankhah, Z. Liu, and N. Hall, *Society of for Experimental Mechanics Annual Conference and Exposition*, 259-264
4. "Characterization of high intensity progressive ultrasound beams in air at 300 kHz", E. Vatankhah, Y. Meng, Z. Liu, Xiaoyu Niu, N. Hall, *The Journal of the Acoustical Society of America*, 153 (5), 2878-2878
5. "The design of an optomechanical microphone using a photonic waveguide interferometer", Xiaoyu Niu, Y. Meng, E. Vatankhah, N. Hall, *The Journal of the Acoustical Society of America*, 153 (3_supplement), A144-A144 **Invited Paper**
6. "MEMS Microphones as Ultrasonic Transducers." Xiaoyu Niu, Y. Meng, Z. Liu, E. Vatankhah, N. Hall, *The Journal of the Acoustical Society of America*, 152 (4), A50-A51, **Best Paper Award**
7. "Measurement of Airborne Ultrasound Using Laser Doppler Vibrometry ", Z. Liu, E. Vatankhah, Y. Meng, Xiaoyu Niu, N. Hall, *Journal of the Acoustical Society of America*, 152 (4), A261-A261
8. "Experimental characterization of high intensity progressive ultrasound beams in air", Y. Meng, E. Vatankhah, Z. Liu, Xiaoyu Niu, R. Williams, N. Hall, *The Journal of the Acoustical Society of America* , 152 (4), A51-A51
9. "An Air-Coupled Electrostatic Ultrasound Transducer Using a MEMS Microphone Architecture." Xiaoyu Niu, Zihuan Liu, Yuqi Meng, Connor M. Hodges, Randall P. Williams, and Neal A. Hall, *Journal of Microelectromechanical Systems* 31, no. 5 (2022): 813-819.
10. "A comparison on sound quality of PLA 3-D printing ukulele and single board wooden ukulele", P. Qian, Xiaoyu Niu, S. Lin, L. Ma, J. Ma, S. Yu, Z. Chen, G. L, S. Fu, J. Lin, *Proceedings of Meetings on Acoustics* 39 (1)
11. "Natural sound (scale) reflecting speaker", Xiaoyu Niu, K. Wu, H. Li, C. Li, S. Zhao, G. Yu, S. Fu, *The Journal of the Acoustical Society of America*, 146 (4), 2853-2853
12. "Effects of different uncertainty settings in Monaco treatment planning system on computation efficiency and dosimetric accuracy", C. Li, J. Zhao, Z. Li, T. Li, Xiaoyu Niu, H. Yue, *Chinese Journal of Medical Physics* 35 (7), 766-770
13. "Broadband and wide-angle blazed acoustic gratings using multiple coupled Helmholtz resonators", Y. Dong, G. Yu, X. Wang, Xiaoyu Niu, K. Wu, N. Wang, *Applied Physics Express*, 10 (9), 097201

PROJECTS

- MEMS Parametric Array for Consumer Electronics** Proposal Submitted
Sponsor: *National Science Foundation*
- High Signal-to-Noise Ratio Miniature Microphones for Hearing Assistive Devices** Proposal Submitted
Sponsor: *National Institutes of Health*
- Integrated Sensors at High-Temperature Using Transferred Piezoelectric Transducers and Epitaxial Transistors (IGNITE)** Jan. 2024 - Jan. 2026
Sponsor: *Defense Advanced Research Projects Agency (DARPA)*
- High-Temperature Photonic MEMS Accelerator** Dec. 2022 - Present
Sponsor: *Department of Energy*
- Research & develop high-temperature accelerator for geothermal exploration.
- Magnatoelastic Sensor Research** Aug. 2022 - Present
Sponsor: *Office of Naval Research*
- Homeland security: research & develop hydrophone and accelerator for detecting nuclear explosion.
- Ultrasonic Transducers for Hypersonics Applications** Dec. 2021 - Present
Sponsor: *Raytheon Technologies*
- Homeland security: target hypersonic vehicles to measure air turbulence.
- Fly Inspired Directional MEMS Microphone** Aug. 2020 - Aug. 2021
Sponsor: *Harman International, Samsung*
- Design and prototype MEMS directional microphone.
 - Target at improving hearing aid to overcome Cocktail Party Effect.
 - Target consumer electronics for receiving sound directionally.
 - Target at helping military soldiers tell where the gun sound comes from.

EXPERIENCE

- Acoustical Society of America Austin Student Chapter** Austin, Texas
Vice Chair Jun.2023 - Present
- Assist chair to hold activities.
 - Work on Girl Day at UT Austin.
- Texas Instruments** Dallas, Texas
MEMS Design Engineer at Kilby Labs May.2023 - Aug. 2023
- Model piezoelectric MEMS microphone using Matlab and COMSOL.
 - Design MEMS directional microphone with 10 dB higher SNR compared to the state-of-art.
 - Patent directional MEMS microphone regarding automotive cabin calling applications.
- Texas Acoustics** Austin, Texas
Coordinator Aug.2021 - Dec.2021