

# ZHE ZHANG

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## EDUCATION

**Institute of Acoustics, Chinese Academy of Sciences (IACAS)** **09/2017-Present**  
Candidate, M.E. in Electronic Engineering  
Major in Audio Signal Processing

**School of Physics Science and Engineering, Tongji University** **09/2013-06/2017**  
B.S. in Applied Physics  
Major in Acoustics  
Overall GPA: 4.6/5.0

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## RESEARCH EXPERIENCE

### DSP-based Implementation of Far-field Sound Source Localization Algorithms

**Institute of Acoustics, Chinese Academy of Sciences (IACAS)**

**2/2019-Present**

- ◆ Optimized sound source localization algorithms like SRP for DSP-based real-time system.
- ◆ Composed a multi-core program to support large computing task of the algorithm.
- ◆ Developed and tested the codes of the algorithms via TMS320C6678 board.
- ◆ Experimented with the prototype and evaluated the accuracy of locating.

### DSP-Based Implementation of a Real-time Sound Field Visualization System

**Institute of Acoustics, Chinese Academy of Sciences (IACAS)**

**08/2018-01/2019**

- ◆ Modified and improved the hardware of TMS320C6678 DSP develop board and microphone array.
- ◆ Performed simulation experiments of SONAH algorithms to evaluate the results and complexity of the algorithm via MATLAB.
- ◆ Designed a multi-core program framework taking advantages of multi-core structure and DDR3 memory to support large computing task with a large storage of coefficients.
- ◆ Developed and tested the embedded programs via computer simulation and experiments.
- ◆ Experimented with the prototype and evaluated the resolution of sound visualization.

### Improved MUSIC Algorithm with Enhanced Matrix for Estimating Harmonic Components

**Institute of Acoustics, Chinese Academy of Sciences (IACAS)**

**11/2017-02/2018**

- ◆ Proposed a method of estimating the number of harmonic components by observing the trend of eigenvalues of self-correlation matrix of the signal's enhanced matrix.
- ◆ Performed the experiments of estimating harmonic components in different SNR situations to evaluate the algorithm.

- ◆ Compared the effects of using different window functions.
- ◆ Compare the results with the Periodogram method.

### **Measurement of Total Sound Energy Density Based on Sound Field Microphone**

**Institute of Acoustics, Tongji University**

**01/2017-06/2017**

- ◆ Designed the structure for Recording A-Format audio signals in different cardinal directions based on Soundfield SPS200 microphone.
- ◆ Computed the filter banks converting A-Format signals to B-Format signals by the Least Square Method.
- ◆ Compared the results of conversion between the built filter bank and the audio plug-in SurroundZone officially provided by Soundfield.

### **Study on the Decay of Sound Energy in Stage-Auditorium Coupled Sound Field of Theaters**

**Institute of Acoustics, Tongji University**

**06/2016-09/2017**

- ◆ Designed and supervised the construction of the scale model of the theater in sound-proof chamber.
- ◆ Measured the T60s of certain points of stage and auditorium inside the model under different situations of acoustical absorption coefficients.
- ◆ Analyzed the collected data to predict the reverberation in different location inside a theater with acoustical coupling phenomenon between stage and auditorium.

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## **PUBLICATIONS**

- ◆ Zhe Zhang, Ming Wu, Jun Yang. DSP-Based Implementation of a Real-time Sound Field Visualization System Using SONAH Algorithm[C]. The 2019 5th International Conference on Harmony Search, Soft Computing and Applications, 2019. (Accepted)
  - ◆ Xinyu Han, Ming Wu, Jun Yang, Zhe Zhang. Sound Source Localization Using Distributed Microphone in Spherical Harmonics Domain[J]. Journal of Signal Processing, 2019. (Accepted)
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## **HONORS & AWARDS**

- ◆ AMBASSADOR of Kadenze, Kadenze.com, 2019
  - ◆ Academic Scholarship, IACAS, 2018
  - ◆ National Encouragement Scholarship, Tongji University, 2016
  - ◆ 2<sup>nd</sup> Class Outstanding Student Scholarship, Tongji University, 2015
  - ◆ Full-race Completed, Shanghai International Marathon, Shanghai, 2014
  - ◆ 1<sup>st</sup> Class Outstanding Student Scholarship, Tongji University, 2014
  - ◆ Successful Participant MCM/ICM Contest, Tongji University, 2014
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## **INTERNS & ACTIVITIES**

- ◆ Audio Engineer & PA Engineer, Traditional Orchestra of University of Chinese Academy of Sciences, Beijing, 09/2018-Present
- ◆ One-man band, The Artifacts of Ripples, Beijing, 03/2018-Present
- ◆ Tech documents composing and translation, Waves Audio Ltd., Beijing, 11/2017-02/2018

- ◆ Composing, Arrangement, Recording, Mixing and Guitarist, Subaqua Roaming Guide (band), Beijing, 09/2017-06/2018
  - ◆ Recording Engineer, The Machinery of Other Skeletons (band), Shanghai, 06/2016-11/2016
  - ◆ Associate Audio Engineer & Stage Tech, MAO Livehouse, Shanghai, 10/2015-02/2017
  - ◆ Bassist & Producer, Narcissus (band), Shanghai, 05/2015–06/2017
  - ◆ Investigator, Environmental Protection Agency of Zhabei District, Shanghai, 2014 Summer
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