

# ZHUOHUANG ZHANG

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## EDUCATION

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### Indiana University Bloomington

*August 2017 - Present*

Doctor of Philosophy

Dual major: Computer Science, Speech and Hearing Sciences

Advisors: [Prof. Donald S. Williamson](#), [Prof. Yi Shen](#)

### University of Rochester

*August 2015 - May 2017*

Master of Science

Electrical and Computer Engineering

Advisor: [Prof. Zhiyao Duan](#)

### Beijing Institute of Technology

*August 2011 - June 2015*

Bachelor of Engineering

Opto-Electrical Information Engineering

## POSITIONS HELD

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### Indiana University Bloomington

- Research Assistant

*Fall 2018 - Present*

- Speech enhancement algorithms for hearing-impaired listeners
- Speech perception on phase distorted speech for hearing-impaired listeners

- Associate Instructor

*Spring 2020*

- CSCI B-455 Principles of Machine Learning, Department of Computer Science

### Microsoft

- Research Intern

*May 2021 - Present*

- Redmond, WA, USA
- Speech enhancement project

- Supervisor: [Dr. Takuya Yoshioka](#)

### Tencent

- Research Intern

*May 2020 - October 2020*

- Tencent AI Lab, Bellevue, WA, USA
- All deep learning MVDR beamformer [\[url\]](#)
- Publication: conference paper [\[url\]](#), journal paper [\[url\]](#)

- Supervisor: [Dr. Yong Xu](#)

- Manager: [Dr. Dong Yu](#)

### DiDi Chuxing

- Research Intern

*Summer 2019*

- DiDi AI Labs, Beijing, China
- GAN-based speech enhancement project
- Publication [\[url\]](#)

- Supervisor: Dr. Hui Song

- Manager: Dr. Xiangang Li

## PUBLICATIONS

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### Conference Papers:

- **Zhuohuang Zhang**, Yong Xu, Meng Yu, Shi-Xiong Zhang, Lianwu Chen, Dong Yu. *ADL-MVDR: All Deep Learning MVDR Beamformer for Target Speech Separation*. ICASSP 2021, Toronto, Canada (to appear).

- **Zhuohuang Zhang**, Piyush Vyas, Xuan Dong, Donald S. Williamson. *An End-to-End Non-intrusive Model For Subjective and Objective Real-world Speech Assessment using a Multi-task Framework*. ICASSP 2021, Toronto, Canada (to appear).
- **Zhuohuang Zhang**, Donald S. Williamson Yi Shen (2020). *Investigation of Phase Distortion on Perceived Speech Quality for Hearing-impaired Listeners*. Interspeech 2020, Shanghai, China.
- **Zhuohuang Zhang**, Chengyun Deng, Yi Shen, Donald S. Williamson, Yongtao Sha, Yi Zhang, Hui Song and Xiangang Li (2020). *On Loss Functions and Recurrency Training for GAN-based Speech Enhancement Systems*. Interspeech 2020, Shanghai, China.
- **Zhuohuang Zhang**, Yi Shen (2019). *Listener Preference on the Local Criterion for Ideal Binary-Masked Speech* (oral). Interspeech 2019, Graz, Austria.
- **Zhuohuang Zhang**, Donald S. Williamson, Yi Shen (2019). *Impact of Amplification on Speech Enhancement Algorithms Using an Objective Evaluation Metric* (poster). ICA 2019, Aachen, Germany.
- **Zhuohuang Zhang**, Yi Shen, Donald S. Williamson (2019). *Objective Comparison of Speech Enhancement Algorithms with Hearing Loss Simulation* (poster). ICASSP 2019, Brighton, UK.
- Zhen Tan, Lianfeng Zhao, Bolin Shan, Jing Wang, Jun Xu, **Zhuohuang Zhang** (2014). *Sulfur Passivation Enhancement for GaSb MOS Devices by Adding H<sub>2</sub>O<sub>2</sub> to (NH<sub>4</sub>)<sub>2</sub>S Solution* (poster). IEEE SISC 2014, San Diego, USA.

#### Journal Papers:

- Yi Shen, Celia Zhang, **Zhuohuang Zhang** (2018). *Feasibility of interleaved Bayesian adaptive procedures in estimating the equal-loudness contour*. The Journal of the Acoustical Society of America.
- Yong Song, Qun Hao, Yue liu, Tianle Tan, **Zhuohuang Zhang** (2014). *Design and Implementation of A Retina-like Imaging System Based on Non-uniform Lens Array*. International Symposium on Optoelectronic Technology and Application, SPIE.
- Qingsheng Luo, Zhongyang Xiao, Pan Lu, **Zhuohuang Zhang**, Lei Zhao (2014). *Mechanical Design and Kinematic Analysis of a Wearable Lumbodorsal Therapeutic Instrument*. Journal of Mechanical & Electrical Engineering.

#### Manuscripts:

- **Zhuohuang Zhang**, Yong Xu, Meng Yu, Shi-Xiong Zhang, Lianwu Chen, Donald S. Williamson, Dong Yu. *Multi-channel Multi-frame ADL-MVDR for Target Speech Separation*. In review, submitted to IEEE/ACM TASLP.
- Yong Xu, **Zhuohuang Zhang**, Meng Yu, Shi-Xiong Zhang, Lianwu Chen, Dong Yu. *Generalized Spatio-Temporal RNN Beamformer for Target Speech Separation*. In review, submitted to Interspeech 2021.

#### INVITED TALKS

- *Impact of phase distortion and phase-insensitive speech enhancement on speech quality perceived by hearing-impaired listeners*, 179th Meeting Acoustic Society of America, Acoustics Virtually Everywhere, 2020.
- *Monaural Speech Enhancement with Convolutional Recurrent Generative Adversarial Networks* (guest lecture), CSCI-B659: Deep Learning for Speech Processing, Indiana University Bloomington, USA, 2019.
- *Impact of Amplification on Speech Enhancement Algorithms Using an Objective Evaluation Metric* (poster), ICA 2019, Aachen, Germany, 2019.
- *Inconsistencies between the predicted qualities of enhanced speech signals from two objective metrics*, 177th Meeting Acoustic Society of America, Louisville, KY, 2019.
- *Can listeners reliably identify their preferred amplification profiles for speech listening?* (poster), 177th Meeting Acoustic Society of America, Louisville, KY, 2019.

#### AWARDS

Research support grant from Indiana Lions Speech and Hearing, Inc.	12/2020
Travel grant from ISCA for Interspeech 2019	07/2019
Research support grant from IU SPHS department	02/2018
Fellowship from IU SPHS department	09/2017

## COMPUTER SKILLS

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**Programming Languages:** Python, MATLAB, C, Bash, PostgreSQL, R, L<sup>A</sup>T<sub>E</sub>X

**Deep Learning Tools:** Tensorflow, PyTorch, Keras

## GRADUATE COURSES

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**Computer Science:** Machine Learning, Data Mining, Deep Learning: Speech Processing, Advanced Operating System, Algorithm Design and Analysis, Artificial Intelligence, Advanced Database Concepts

**Speech and Hearing Sciences:** Auditory Anatomy & Physiology, Psychoacoustics, Bayesian Data Analysis, Speech Seminar, Hearing Seminar, Instrumentation Methods, Research & Ethics in Speech, Language, and Hearing

**Electrical Engineering:** Audio Software Design, Digital Image Processing, Digital Signal Processing, Random Process, Audio Signal Processing, Digital Video Processing, Network Science Analytics