

Weipeng He

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Research Interests

Audio and Speech Processing · Machine Learning · Robot Audio Perception

Education

École Polytechnique Fédérale de Lausanne (EPFL)

Ph.D. Candidate

— Supervisors: [Dr. Jean-Marc Odobez](#) and [Dr. Petr Motlicek](#)

Switzerland

anticipated graduation in September 2020

University of Hamburg

M.Sc. in *Intelligent Adaptive Systems*, GPA: 1.38/1.0 (excellent)

Germany

September 2015

Tsinghua University

B.E. in *Computer Science and Technology*, GPA: 90/100 (top 10%)

B.S. in *Pure and Applied Mathematics* (second major), GPA: 83/100

China

July 2012

Experience

Idiap Research Institute

Research Assistant

Switzerland

June 2016 — Present

- Investigate deep learning-based approaches for sound source localization in real human robot interaction scenarios. Achieve more than 90% precision and recall for detecting and localizing multiple simultaneous sources in real-time. [[video demo](#)]
- Investigate simultaneous localization and speech/non-speech classification of multiple sound sources. The joint multi-task approach significantly outperforms traditional methods those sequentially process localization and classification. [[video demo](#)]
- Study data augmentation and domain adaptation for low-resource training of sound source localization neural networks.

Facebook

Research Intern

USA

July — October 2019

- Research on deep beamforming networks for far-field automatic speech recognition. Propose the spatial attention that improves the recognition rate by 9% on smart speakers.

6Estates

Software Engineer

Singapore

January — May 2016

- Develop back-end web interface of a deep learning based business insight information retrieval system.

University of Hamburg

Research Assistant

Germany

October 2012 — November 2015

- Research on interactive object recognition with audio-visual sensory fusion.

Hulu (Beijing)

Research Intern

China

July — September 2012

- Optimize search engine with fast approximate string matching.

Publications

- Spatial attention for far-field speech recognition with deep beamforming neural networks.
Weipeng He, Lu Lu, Biqiao Zhang, Jay Mahadeokar, Kaustubh Kalgaonkar and Christian Fuegen,
2020 *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* [[preprint](#)]
- Adaptation of multiple sound source localization neural networks with weak supervision and domain-adversarial training.
Weipeng He, Petr Motlicek and Jean-Marc Odobez,
2019 *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* [[doi](#)]
- MuMMER: Socially intelligent human-robot interaction in public spaces.
Mary Ellen Foster, Weipeng He, et al.
arXiv:1909.06749, 2019 [[preprint](#)]
- Joint localization and classification of multiple sound sources using a multi-task neural network.
Weipeng He, Petr Motlicek and Jean-Marc Odobez,
Proc. Interspeech 2018 (best student paper award finalist) [[doi](#), [video](#)]
- Deep neural networks for multiple speaker detection and localization.
Weipeng He, Petr Motlicek and Jean-Marc Odobez,
2018 *IEEE International Conference on Robotics and Automation (ICRA)* [[doi](#), [video](#)]
- Multimodal object recognition from visual and audio sequences.
Weipeng He, Haojun Guan and Jianwei Zhang,
2015 *IEEE Int. Conf. on Multisensor Fusion and Information Integration for Intelligent Systems (MFI)*
- What to do first: the initial behavior in a multi-sensory household object recognition and categorization system.
Haojun Guan, Weipeng He and Jianwei Zhang,
2014 *IEEE Int. Conf. on Multisensor Fusion and Information Integration for Intelligent Systems (MFI)*
- THUNLP at TAC KBP 2011 in entity linking.
Yu Zhao, Weipeng He, Zhiyuan Liu and Maosong Sun,
Proceedings of TAC, 2011

Technical Skills

Programming: Python · C · C++ · Java · MATLAB
 Libraries: PyTorch · Gstreamer · OpenCV · GSL · OpenMP · OpenMPI · Spark
 Other Tools: Vim · Bash · \LaTeX · GDB · Git · Mercurial · Gnuplot

Languages

English: Fluent
 Chinese: Native Speaker
 German: Basic
 French: Basic

Miscellaneous

Interests: Snowboarding · Classical Guitar
 GitHub: github.com/hwp (highlight projects: [apkit](#), [notGHMM](#))