

Weipeng He

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Research Interests

Audio and Speech Processing · Machine Learning · Robot Auditory Perception

Education

École Polytechnique Fédérale de Lausanne (EPFL)

Ph.D. Candidate

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

Switzerland

anticipated graduation in Nov. 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

- [1] 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,
in *2020 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* [doi]
- [2] The MuMMER Data Set for Robot Perception in Multi-Party HRI Scenarios.
Olivier Canevet, Weipeng He, Petr Motlicek, and Jean-Marc Odobez,
in *2020 29th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*
- [3] Adaptation of multiple sound source localization neural networks with weak supervision and domain-adversarial training.
Weipeng He, Petr Motlicek, and Jean-Marc Odobez,
in *2019 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* [doi]
- [4] MuMMER: Socially intelligent human-robot interaction in public spaces.
Mary Ellen Foster, Weipeng He, et al.
in *Proc. AI-HRI 2019* [preprint]
- [5] Joint localization and classification of multiple sound sources using a multi-task neural network.
Weipeng He, Petr Motlicek, and Jean-Marc Odobez,
in *Proc. Interspeech 2018 (best student paper award finalist)* [doi, video]
- [6] Deep neural networks for multiple speaker detection and localization.
Weipeng He, Petr Motlicek, and Jean-Marc Odobez,
in *2018 IEEE International Conference on Robotics and Automation (ICRA)* [doi, video]
- [7] Multimodal object recognition from visual and audio sequences.
Weipeng He, Haojun Guan, and Jianwei Zhang,
in *2015 IEEE Int. Conf. on Multisensor Fusion and Information Integration for Intelligent Systems (MFI)*
- [8] What to do first: the initial behavior in a multi-sensory household object recognition and categorization system.
Haojun Guan, Weipeng He, and Jianwei Zhang,
in *2014 IEEE Int. Conf. on Multisensor Fusion and Information Integration for Intelligent Systems (MFI)*
- [9] THUNLP at TAC KBP 2011 in entity linking.
Yu Zhao, Weipeng He, Zhiyuan Liu, and Maosong Sun,
in *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

GitHub: github.com/hwp (highlight projects: [apkit](#), [notGHMM](#))