Weipeng He

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Research Interests

Robot Audio Perception · Audio and Speech Processing · Machine Learning

Education

École Polytechnique Fédérale de Lausanne (EPFL)   Switzerland
  Ph.D. Candidate   enrolled since 2016
  - Supervisors: Dr. Jean-Marc Odobez and Dr. Petr Motlicek

University of Hamburg   Germany
  M.Sc. in *Intelligent Adaptive Systems*, GPA: 1.38/1.0 (excellent)   September 2015

Tsinghua University   China
  B.E. in *Computer Science and Technology*, GPA: 90/100 (top 10%)   July 2012
  B.S. in *Pure and Applied Mathematics* (second major), GPA: 83/100

Experience

Idiap Research Institute   Switzerland
Research Assistant   June 2016 — Present

- Investigate deep learning-based methods 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 method for 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   USA
Research Intern   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 speaker devices.

6Estates   Singapore
Software Engineer   January — May 2016

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

University of Hamburg   Germany
Research Assistant   October 2012 — November 2015

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

Hulu (Beijing)   China
Research Intern   July — September 2012

- Optimize search engine for with fast approximate string matching.

Publications

- 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]

- 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,
  arXiv:1911.02115, 2019

- MuMMER: Socially Intelligent Human-Robot Interaction in Public Spaces.
  Mary Ellen Foster, et al.
  arXiv:1909.06749, 2019

- 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 (nominated for a best student paper award) [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)