

# Hainan Xu

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## Research Interests

speech recognition, end-to-end speech recognition, language modeling, machine translation

## Education

### **Center for Language and Speech Processing, Johns Hopkins University**

PhD student in the Department of Computer Science 2013/08 - present

Advisor: [Daniel Povey](#), [Sanjeev Khudanpur](#)

GPA: 4.0 / 4.0

## Work Experience

### **Spoken Communications, Seattle Washington**

Research Intern 2017/05 - 2017/08

Incorporated TensorFlow-based RNNLM support for open-source toolkit Kaldi. More information could be found in [Google developers blog](#).

### **Google Inc. New York City, New York**

Research Intern 2015/05 - 2015/08

Advisor: [Cyril Allauzen](#), [Michael Riley](#)

Improved twiddler n-gram language models for Google speech recognition utilizing location and other contextual information, using finite state methods implemented with [OpenFst](#) and [OpenGrm](#).

## Publication

**Hainan Xu**, Shuoyang Ding, Shinji Watanabe, *Improving End-to-end Speech Recognition with Pronunciation-assisted Sub-word Modeling*, ICASSP 2019

**Hainan Xu**, Tongfei Chen, Dongji Gao, Yiming Wang, Ke Li, Nagendra Goel, Yishay Carmiel, Daniel Povey, Sanjeev Khudanpur: *A Pruned Rnnlm Lattice-rescoring Algorithm for Automatic Speech Recognition*, ICASSP 2018

**Hainan Xu**, Ke Li, Yiming Wang, Jian Wang, Shiyin Kang, Xie Chen, Daniel Povey, Sanjeev Khudanpur. *Neural Network Language Modeling with Letter-based Features and Importance Sampling*, ICASSP 2018

**Hainan Xu**, Philipp Koehn. *Zipporah: A Fast and Scalable Data Cleaning System for Noisy Web-crawled Parallel Corpora*. EMNLP 2017.

**Hainan Xu**, Guoguo Chen, Daniel Povey and Sanjeev Khudanpur. *Modeling Phonetic Context with Non-random Forests for Speech Recognition*. Interspeech 2015.

Guoguo Chen, **Hainan Xu**, Minhua Wu, Daniel Povey and Sanjeev Khudanpur. *Pronunciation and Silence Probability Modeling for ASR*. Interspeech 2015.

Kai Yu and **Hainan Xu**. *Cluster Adaptive Training With Factorized Decision Trees For Speech Recognition*. Interspeech 2013.

Ke Li, **Hainan Xu**, Yiming Wang, Daniel Povey, Sanjeev Khudanpur. *Recurrent Neural Network Language Model Adaptation for Conversational Speech Recognition*. Interspeech 2018

Zhehuai Chen, Justin Luitjens, **Hainan Xu**, Yiming Wang, Daniel Povey, Sanjeev Khudanpur. *A GPU-based WFST Decoder with Exact Lattice Generation*. Interspeech 2018

Szu-Jui Chen, Aswin Shanmugam Subramanian, **Hainan Xu**, Shinji Watanabe. *Building state-of-the-art distant speech recognition using the CHiME-4 challenge with a setup of speech enhancement baseline*. Interspeech 2018

Daniel Povey, Gaofeng Cheng, Yiming Wang, Ke Li, **Hainan Xu**, Mahsa Yarmohamadi, Sanjeev Khudanpur. *Semi-Orthogonal Low-Rank Matrix Factorization for Deep Neural Networks*. Interspeech 2018

Yiming Wang, Vijayaditya Peddinti, **Hainan Xu**, Xiaohui Zhang, Daniel Povey, Sanjeev Khudanpur. *Backstitch: Counteracting Finite-sample Bias via Negative Steps*. Interspeech 2017

Huda Khayrallah, **Hainan Xu**, Philipp Koehn. *The JHU Parallel Corpus Filtering Systems for WMT 2018*. EMNLP 2018, 3rd conference on machine translation

**Hainan Xu**, Yuchen Fan and Kai Yu. *Development of the 2012 SJTU HVR System*. The 14th ACM International Conference on Multimodal Interaction 2012