

Matthew Wiesner

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RESEARCH INTERESTS

Speech processing with emphasis on multi-lingual and cross-lingual modeling for ASR and topic identification from speech, especially for low-resource languages.

EDUCATION

Johns Hopkins University Sep 2014 - Present

Ph.D. Candidate in Electrical Engineering

Advisor: Sanjeev Khudanpur

Johns Hopkins University May 2016

Masters Engineering, Electrical

McGill University Dec 2013

B.Eng Electrical Engineering / Minor in Arabic Language

Relevant Courses:

Automatic Speech Recognition, Information Extraction from Speech and Text, Wavelets and Filter Banks, Representation Learning, Random Signal Analysis, Information Theory, Optimization Algorithms, Matrix Analysis

EXPERIENCE

Research Assistant at Johns Hopkins Sep 2014 - Present

Low Resource Languages for Emergent Incidents (LORELEI) (Fall 2016 - Present): Developed cross-lingual acoustic models for zero-shot and very low resource ASR as well as methods for universal grapheme-to-phoneme transduction.

IARPA Babel (Spring 2016): Developed techniques for replacing phonemic lexicons with graphemic lexicons in ASR and KWS pipelines.

Intern at Facebook AI Research Spring 2019

Developed new objective functions for semi/self-supervised learning of ASR systems, with a focus on low-resource languages. I worked extensively in and contributed to fairseq.

Teaching Assistant at Johns Hopkins Fall 2016

Machine Learning for Signal Processing: Created some course content, held tutorials, lectured, and graded. Course material included clustering algorithms, dimensionality reduction, kernel methods, Kalman filters, dictionary learning, EM.

Grader at Johns Hopkins for Representation Learning Fall 2015

Research Assistant at Colorado State University Summer 2013, Jan - July 2014

Developed machine learning and image processing techniques for weather radar data analysis and created an unsupervised bow-echo detection algorithm used to create a bow-echo training corpus.

PUBLICATIONS

Matthew Wiesner, Adithya Renduchintala, Shinji Watanabe, Chunxi Liu, Najim Dehak, Sanjeev Khudanpur, *Pretraining by Backtranslation for End-to-end ASR in Low-Resource Settings*, INTERSPEECH 2019

Martin Karafit, Murali Karthick Baskar, Shinji Watanabe, Takaaki Hori, **Matthew Wiesner**, Jan “Honza” Černocký, *Analysis of Multilingual Sequence-to-Sequence speech recognition systems*, INTERSPEECH 2019

Oliver Adams, **Matthew Wiesner**, Shinji Watanabe, David Yarowsky, *Massively Multilingual Adversarial Speech Recognition*, NAACL 2018

Jaejin Cho, Murali Karthick Baskar, Ruizhi Li, **Matthew Wiesner**, Sri Harish Mallidi, Nelson Yalta, Martin Karafiat, Shinji Watanabe, Takaaki Hori, *Multilingual sequence-to-sequence speech recognition: architecture, transfer learning, and language modeling*, SLT 2018

Chunxi Liu, **Matthew Wiesner**, Shinji Watanabe, Craig Harman, Jan Trmal, Najim Dehak, Sanjeev Khudanpur, *Low-Resource Contextual Topic Identification on Speech*, SLT 2018

Matthew Wiesner, Chunxi Liu, Lucas Ondel, Craig Harman, Vimal Manohar, Jan Trmal, Zhongqiang Huang, Najim Dehak, Sanjeev Khudanpur, *Automatic Speech Recognition and Topic Identification for Almost-Zero-Resource Languages*, INTERSPEECH 2018.

Adithya Renduchintala, Shuoyang Ding, **Matthew Wiesner** and Shinji Watanabe, *Multi-Modal Data Augmentation for End-to-end ASR*, INTERSPEECH 2018 (**Best Student Paper**)

Shinji Watanabe, Takaaki Hori, Shigeki Karita, Tomoki Hayashi, Jiro Nishitoba, Yuya Unno, Nelson Enrique Yalta Soplin, Jahn Heymann, **Matthew Wiesner**, Nanxin Chen, Adithya Renduchintala, Tsubasa Ochiai, *ESPnet: End-to-End Speech Processing Toolkit*, INTERSPEECH 2018.

Chunxi Liu, Jan Trmal, **Matthew Wiesner**, Craig Harman, Sanjeev Khudanpur, *Topic Identification for Speech without ASR*, INTERSPEECH 2017 (**Nominated for Best Student Paper**).

Jan Trmal, **Matthew Wiesner**, Vijayaditya Peddinti, Xiaohui Zhang, Pegah Ghahremani, Yiming Wang, Vimal Manohar, Hainan Xi, Daniel Povey, Sanjeev Khudanpur, *The Kaldi OpenKWS System: Improving Low Resource Keyword Search*, INTERSPEECH 2017.

Matthew Wiesner, Joseph Hardin, V. Chandrasekaran, *Automated Detection of Radar Severe Weather Signatures*, American Meteorological Society 2014.

PROGRAMMING

Python, C++, shell scripting, MATLAB, Kaldi, Pytorch, Fairseq

LANGUAGES

Bilingual: English/French

Proficient: Spanish, Portuguese, Modern Standard Arabic