Cheng-I Jeff Lai

CONTACT INFORMATION

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RESEARCH INTERESTS

Deep Learning, Speech Processing, Speaker Recognition, Neural Machine Translation, Speech Synthesis

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA — (Expected) Sep 2019
Ph.D. in Electrical Engineering and Computer Science

Johns Hopkins University, Baltimore, MD — Sep 2015 - Dec 2018
B.S. in Electrical Engineering
Advisors: Prof. Najim Dehak and Dr. Jesús Villalba

PUBLICATIONS

Cheng-I Lai, Nanxin Chen, Jesús Villalba, Najim Dehak,. "ASSERT: Anti-Spoofing with Squeeze-Excitation and Residual neTworks," [Submitted to Interspeech 2019][Code]

Cheng-I Lai. "Contrastive Predictive Coding Based Feature for Automatic Speaker Verification," [Bachelor Thesis][Code]

Kelly Marchisio, Jialiang Guo, **Cheng-I Lai**, Philipp Koehn. "Controlling the Complexity of Machine Translation Output," [Submitted to ACL 2019].

Cheng-I Lai, Alberto Abad, Korin Richmond, Junichi Yamaghashi, Najim Dehak, Simon King. "Attentive Filtering Network for Audio Replay Attacks Detection," [ICASSP 2019][Code]

Phani Nidadavolu, **Cheng-I Lai**, Jesús Villalba, Najim Dehak. "Investigation on Bandwidth Extension for Speaker Recognition," [Interspeech 2018]

TALKS

Deep Learning Frameworks for Anti-Spoofing — Oct 2018
Gulf Coast Undergraduate Research Symposium, Rice University

Attentive Filtering Network for Audio Replay Attacks Detection — Oct 2018
Center for Language and Speech Processing Graduate Seminar, Johns Hopkins University

Attentive Filtering Network for Audio Replay Attacks Detection — Aug 2018
Centre for Speech Technology Research Seminar, Informatics Forum, University of Edinburgh

POSTERS

Phani Nidadavolu, **Cheng-I Lai**, Jesús Villalba, Najim Dehak. "Investigation on Bandwidth Extension for Speaker Recognition," Poster presentation at Interspeech, September 2018, Hyderabad, India.

Cheng-I Lai, Phani Nidadavolu, Jesús Villalba, Najim Dehak. "Deep Bandwidth Extension for Speaker Recognition," Poster presentation at 2018 Johns Hopkins Research Symposium, April 2018, Baltimore, MD.

Cheng-I Lai, Jesús Villalba, Najim Dehak. "Voice Activity Detection of Noisy Speech Utterances with LSTM," Poster presentation at 2017 Johns Hopkins Research Symposium, April 2017, Baltimore, MD.

RESEARCH EXPERIENCES

Research Assistant — Sep 2016 - Present
Center for Language and Speech Processing (CLSP), Johns Hopkins University
Advisor: Prof. Najim Dehak and Dr. Jesús Villalba

- Investigated DNN frameworks for ASVspoof 2019 Challenge.
- Built a speaker recognition system based on contrastive predictive coding features.
- Integrated DNN-based bandwidth extension network for speaker recognition systems.
- Designed automatic speech biomarkers with acoustic model for Parkinson's disease detection.
- Applied LSTM to robust voice activity detection of noisy speeches.
- Speech gender identification with bottleneck features and linear discriminant analysis.

Research Intern Summer 2018
Informatics Forum, University of Edinburgh
Advisor: Prof. Simon King and Prof. Korin Richmond
- Proposed Attentive Filtering Network for audio replay attacks detection and achieved 30% relative improvement over the enhanced baseline system on ASVspoof 2017 Version 2.0 dataset.

Research Intern Summer 2017
Human Language Technology Center of Excellence (HLTCOE), Johns Hopkins University
Advisor: Prof. Najim Dehak and Dr. Jesús Villalba
- Investigated audio event classification with LSTM and HMM for National Institute of Standards and Technology OpenSat evaluation.

AWARDS

Third Place, 2019 Automatic Speaker Verification Spoofing and Countermeasures Challenge 2019
Travel Grant, Gulf Coast Undergraduate Research Symposium, Rice University 2018
Vredenburg Scholarship, Johns Hopkins University 2018
Idea Lab Diversity Innovation Grants Winner, Johns Hopkins University 2016
Winner of MedHacks and Best with Wolfram API Tech Award 2016
Student Initiative Fund and Digital Da Vinci Award, Johns Hopkins University 2016
Dean's List (All semesters), Johns Hopkins University 2015-2018

SELECTED COURSEWORK

Machine Learning:
Machine Learning for Signal Processing, Vision as Bayesian Inference, Machine Translation

Audio Processing:
Speech and Auditory Processing, Audio Signal Processing, Digital Signal Processing

SKILLS

Computer Skills:
- Proficient: Python, Shell, MATLAB, GPU computing, Large-scale data processing
- Familiar: LaTeX, Java, R

Programming Frameworks:
Kaldi, PyTorch, Keras, scikit-learn

Languages:
Mandarin (native), English (fluent)