Chunlei Zhang

Center for Robust Speech Systems (CRSS)
Erik Jonsson School of Engineering and Computer Science
University of Texas at Dallas (UTD)

zhangclei89@gmail.com
469-818-1468
718 Brentwood Ln, 75080, TX
Personal website

Education

2014- Ph.D Candidate, UT Dallas
Center for Robust Speech Systems (CRSS)
John.H.L.Hansen

2007-2014 BEng & MEng
Northwestern Polytechnical University, China
Research Focus: Speaker ID & Sound Source Localization
Xiangyang Zeng

Research Experiences

Robust Speaker Recognition/Verification, Stress/Emotion detection, Deep learning, Automatic Speech Recognition

- Participated NIST Speaker Recognition Evaluation 2016 (SRE 2016), the main feature of this evaluation is the domain mismatch. The participants are given huge amount of English corpus as training data, such as previous SREs, SWB, Fisher English etc. But the actual enrollment data for speaker models and the test data are from different languages. This condition makes English-based acoustic modeling (i.e., GMMs and DNNs) not as effective as it for non-English data. We proposed several techniques to compensate this language (domain) mismatch, see our system description paper for details.

- Proposed a phonetic variability constrained bottleneck feature for text-independent speaker recognition. We propose to use UBM to contextualize features as input of the DNN. By training a speaker discriminative DNN, we are able to extract speaker discriminative bottleneck feature for back-end development. We show very competitive results compared with state-of-the-art i-Vector PLDA system.

- Investigated deep learning frameworks for spoofing detection from speech. CNN and RNN is employed to this task with spectrogram as input feature. Besides that, a deep leaning architecture which integrates both CNN and RNN is proposed. The newly proposed model generalized well for unseen attacks.

Projects

2016 NIST SRE16:
Serve as the lead student in the NIST SRE 2016 submission from the CRSS group, also as a coordinating person of CRSS for I4U (a large scale cooperation of 14 research institutes, including I^2R, LIUM, Alibaba Group, UNSW, AAU, NTU, etc.) submission. Our single-lab primary submission outperforms I4U, I^2R-NUT, SRI International, etc.

2016 Computational Paralinguistics Challenge (ComParE), Interspeech 2016-Deception Sub-Challenge:
Detect deception from speech, used deep learning methods on deception detection.

2015 NIST LRE i-vector Challenge:
Language identification machine learning challenge based on i-Vector, one of the lead student of CRSS participating in the challenge, 3rd place lab-wise ranking.

2015 ASVspoof 2015:
Automatic Speaker Verification Spoofing and Countermeasures Challenge, Lead person of CRSS participating in the challenge, 6th place.

2014 Physical stress detection, assessment & Speaker ID on physical stressed condition:
Lab research, funded by USAF Research. Explore physical stress sensitive features for stress detection and assessment, investigate stress insensitive features for stress robust SID tasks.

2013 Natural Science Foundation of China:
Used human auditory system inspired narrowband binaural clues such as Interaural Time Difference (ITD), Interaural Level Difference (ILD) to localize sound source, separated the sound mixture based on these narrowband localization outcomes. Improved the speaker localization and identification performance in the noisy and reverberant environment.

2012 Graduate Innovation Fund of NPU:
Implemented a small scale speaker verification system (using joint information from a speaker ID system and an isolated work speech recognition to verify speaker) in an embedded Linux system.

Internship Experiences

2014 Nuance (Shanghai Branch):
Summer internship. NLP related topics, word Segment, robust feature selection for Chinese Mandarin word segmenter.

2011 Huawei Technology Co., Ltd:
Implemented an isolated word speech recognition system for alarming word monitoring using C. Developed a new critical band variance based SAD algorithm.

Publications

NIST SRE16 **Chunlei Zhang**, Fahimeh Bahmaninezhad, Shivesh Ranjan, Chengzhu Yu, Navid Shokouhi, John Hansen. UTD-CRSS systems for 2016 NIST speaker recognition evaluation. *arXiv preprint arXiv:1610.07651*, 2016.

IEEE ICASSP 17 Srinivas Parthasarathy, **Chunlei Zhang**, John Hansen, Carlos Busso. A study of speaker verification performance with expressive speech. Submitted to *IEEE ICASSP*, 2017.

IEEE JSTSP **Chunlei Zhang**, Chengzhu Yu, John Hansen. An investigation of deep learning frameworks for speaker verification anti-spoofing [J]. **Accepted** by *IEEE Journal of Selected Topics in Signal processing*, 2016.

INTERSPEECH17 **Chunlei Zhang**, Chengzhu Yu, Shivesh Ranjan and John Hansen. Phonetic variability constrained bottleneck feature for text-independent speaker recognition. In preparation for *INTERSPEECH*, 2017.

INTERSPEECH16 Chengzhu Yu, **Chunlei Zhang**, Finnian Kelly, John Hansen. Text Available Speaker Recognition for Forensic Application. *ISCA INTERSPEECH*, 2016.

IEEE ICASSP16 **Chunlei Zhang**, Shivesh Ranjan, Mahesh Kumar Nandwana, Qian Zhang, Abhinav Misra, Gang Liu, Finnian Kelly, John Hansen, Joint information from Nonlinear and Linear features for spoofing detection: an i-Vector/DNN based approach. *IEEE ICASSP*, 2016. (**IEEE SPS Ganesh N. Ramaswamy Memorial Student Grant**)

Chengzhu Yu, **Chunlei Zhang**, Shivesh Ranjan, Qian Zhang, Abhinav Misra, Finnian Kelly, John Hansen, UTD-CRSS System for the NIST 2015 Language Recognition i-Vector Machine Learning Challenge. *IEEE ICASSP*, 2016.

Shivesh Ranjan, Chengzhu Yu, **Chunlei Zhang**, Finnian Kelly, John Hansen, Language Recognition using Deep Neural Networks with very limited Training Data. *IEEE ICASSP*, 2016.

INTERSPEECH15 **Chunlei Zhang**, Gang Liu, Chengzhu Yu, John HL Hansen. I-Vector Based Physical Task Stress Detection with Different Fusion Strategies. *ISCA INTERSPEECH*, 2015.

Abhinav Misra, Shivesh Ranjan, **Chunlei Zhang**, John HL Hansen. Anti-Spoofing System: An Investigation of Measures to Detect Synthetic and Human Speech. *ISCA INTERSPEECH*, 2015.

ICCSNT13 Xiangyang Zeng, Qiang Wang, **Chunlei Zhang**, Huaizhen Cai.Feature selection based on ReliefF and PCA for underwater sound classification. *IEEE, Computer Science and Network Technology (ICCSNT)*, 2013

ICSPCC13 **Chunlei Zhang**, Xiangyang Zeng, Guimin Zhang. GMM-based binaural localization of sound sources in both simulated and real rooms. *IEEE*, *Signal Processing, Communication and Computing (ICSPCC)*, 2013.

Technical Acoustics **Chunlei Zhang**, Xiangyang Zeng, Shuguang Wang. A Voice Activity Detection Algorithm Based on the Variance of Critical Band Power Spectrum [J].*Technical Acoustics*, 2012, 31(2), 204-208.

Technical Acoustics Jiaruo He, Xiangyang Zeng, **Chunlei Zhang**. Design of an Indoor Alarm Words Recognition System [J]. *Technical Acoustics*, 2011, 30(5), 56-59.

Skills

Programming Language: Python, bash, Matlab, C/C++, with practical experiences.
Chinese Mandarin (native), English (work proficiency)
Toolkit: Kaldi, Theano, scikit learn

Academic service

Reviewer of journals: Speech Communications
IEEE Journal of Selected Topics in Signal Processing

Reviewer of conferences: INTERSPEECH 2016