Vimal Manohar

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Research Interests: Speech Processing, Machine Learning, Natural Language Processing

Education

Johns Hopkins University, Baltimore, MD
Major: Electrical & Computer Engineering
Master of Science in Engineering (M.S.E.), 2015
Doctor of Philosophy (Ph.D.), 2019
Advisors: Sanjeev Khudanpur and Daniel Povey
Thesis topic: Semi-supervised training of acoustic models for automatic speech recognition

Indian Institute of Technology Madras, Chennai, India
Major: Electrical Engineering, Minor: Operations Research
Bachelor of Technology (B.Tech), 2013 (CGPA: 9.6/10)
Advisor: S Umesh,

Key Publications

- **V. Manohar**, S. J. Chen et al., "Acoustic Modeling for Overlapping Speech Recognition: Jhu Chime-5 Challenge System", *2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2019
- **V. Manohar**, P. Ghahremani et al., "A Teacher-Student Learning Approach for Unsupervised Domain Adaptation of Sequence-Trained ASR Models," *2018 IEEE Spoken Language Technology Workshop (SLT)*, 2018
- **V. Manohar**, H. Hadian et al., "Semi-Supervised Training of Acoustic Models Using Lattice-Free MMI," *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018
- **V. Manohar**, D. Povey et al., "JHU Kaldi system for Arabic MGB-3 ASR challenge using diarization, audio-transcript alignment and transfer learning,"' *2017 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, 2017
- P. Ghahremani, **V. Manohar** et al. "Investigation of Transfer Learning for ASR using LF-MMI Trained Neural Networks," *2017 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, 2017
- D. Povey, V. Peddinti, **V. Manohar** et al., "Purely Sequence-Trained Neural Networks for ASR Based on Lattice-Free MMI," *Interspeech 2016*, pp. 2751-2755, Aug. 2016
- V. Peddinti, **V. Manohar** et al., "Far-Field ASR Without Parallel Data," *Interspeech 2016*, Aug. 2016
- C. Liu, P. Jyothi, **V. Manohar** et al., "Adapting ASR for under-resourced languages using mismatched transcriptions,"' *2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2016. **Won Speech and Language Processing student paper award**
- V. Peddinti, G. Chen, **V. Manohar** et al., "JHU ASpIRE system: Robust LVCSR with TDNNs, iVector adaptation and RNN-LMs,"' *2015 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, 2015
- **V. Manohar**, D. Povey, S. Khudanpur, "Semi-supervised Maximum Mutual Information Training of Deep Neural Network Acoustic Model," *Interspeech*, 2015. **Nominated for best students' paper award**.
- J. Trmal, **V. Manohar** et al., "A keyword search system using open source software," *2014 IEEE Spoken Language Technology Workshop (SLT)*, pp.530,535, 2016
- **V. Manohar**, C. B. Srinivas, S. Umesh, "Acoustic modeling using transform-based phone-cluster adaptive training," *2013 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, pp.49,54, 2013

Research and Industrial Experience

Research Scientist at Facebook Inc.
New York, NY, USA — Sept '19 – *Current*
Multi-modal Video Understanding Group

Research Intern at Microsoft Research
Redmond, WA, USA — June – August '16
Mentor: Mike Seltzer
As an intern in the Speech and Dialog Group, worked on robust speech recognition and lightly-supervised ASR.

Jelinek Summer Workshop on Speech and Language Technology (JSALT) 2015
University of Washington Seattle, Seattle, WAS, USA — July – August '15
Member of the research group working on "Probabilitic Transcription of Languages with no native-language transcribers". We showed the utility of mismatched transcriptions from non-native crowdworkers for ASR.

Research Assistant at the Center for Language and Speech Processing
Johns Hopkins University, Baltimore, MD, USA — Aug '13 – Present
MGB-3 Challenge 2017
Worked on speaker diarization, lightly-supervised ASR and transfer learning across domains and dialects (ASRU 2017). Placed second in the challenge.

NIST OpenSAT 2017
Worked on neural network-based speech activity detection using LSTM and statistics pooling for long temporal context

IARPA Babel
Low-resource ASR, speech segmentation, semi-supervised training for ASR

DARPA BOLT
Multilingual DNN for transfer learning across dialects

Intern at Analog Devices Inc.
Cambridge, MA, USA — May – Aug '14
Worked on time-frequency masks with multichannel audio for robust speech recognition

Bachelor's Thesis Project
Indian Institute of Technology Madras, Chennai, India — Sept '12 – May '13
Proposed phone cluster-adaptive training model for low-resource ASR. (ASRU, 2013)

Research Intern at The Institute of Automation
University of Bremen, Bremen, Germany — May – July '12
Worked on modeling 3D objects from stereo images.

Texas Instruments Analog Design Contest 2011
Indian Institute of Technology Madras, Chennai, India — Sept '11 – Feb '12
Designed and constructed a pulse oximeter on an embedded system for real-time estimation of respiratory rate. Among the top 25 entries to the TI India Analog Design Contest 2011.

Teaching Experience

Fall 2015 — Teaching Assistant, Random Signal Analysis

Distinctions

- Alexa Graduate Fellowship 2018, Amazon Inc.
- ECE Graduate Fellowship 2013, Johns Hopkins University
- Hamburger Fellowship 2013, Johns Hopkins University
- WISE Scholarship 2012, DAAD, Germany
- All India Rank **191** in IIT-Joint Entrance Examination (IIT-JEE) 2009
- Kishore Vaignayik Protsahan Yojana (KVPY) Fellowship 2008, Govt. of India
- National Talent Search (NTS) Scholarship 2007, Govt. of India

- Member of IIT Madras team at the National Robotics Contest, Abu Robocon 2011. Placed among the Top 5 in India

Skills

Languages:	C/C++, Python, Bash, MATLAB
Toolkits:	Kaldi, HTK, CNTK

References

Will be provided on request.