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Experience

Microsoft — Bellevue, W.A., U.S.A.
Speech Scientist — *Feb. 2014 – Sept. 2016*

- *Deep Learning (DL)-based Acoustic Models on Devices*
  This project delivered DL-based acoustic models on battery-powered low-computational resource devices. During the project, a few novel techniques are also invented:
  - *Split-VQ for DL model compression and runtime speed-up*: reduce the DL-model size by about 80% and reduce runtime computation by about 90%;
  - *Reduced neural computation acoustic models*: further lower the cost of the likelihood score computation per speech frame; especially useful for RNNs/CNNs.
- *Deploying LSTM-based Acoustic Models into Microsoft Speech Service*
  This project established an high-throughput LSTM-based acoustic model training pipeline and an efficient runtime decoder. The final in-service model was trained on more than 15K speech hours' data in less 3 days and it outperforms the best DNN-based acoustic models by more than 10% in WER with less than 0.2xRT computational cost.
- *Large Scale Distributed Training of Deep Learning Machines*
  Distributed training of DNNs/RNNs/CNNs using 64 GPUs to achieve ∼56x speed-up without modelling accuracy degradation; world record on DNN training speed; training LSTM-based acoustic model on more than 15K speech hours' data in less than 3 days.
- *Deep Learning Software Framework*
  One of the main contributors to the Microsoft CNTK project since early 2015.

Cambridge University — Cambridge, U.K.
PhD student — *Oct. 2009 – Jan. 2014*

- *Acoustic Factorization for Speech Recognition*
  This project aimed to adapting speech recognition systems to a large number of speakers under various ambient environments in an orthogonal manner.
- *Speech Recognition in Reverberant Environments*
  This project aimed to improve speech recognition robustness under reverberant environments using only single distant microphones.
- *Participated in GALE Program*
  Worked as a member of AGILE team in the DARPA-founded GALE program; developed and built Mandrin and Arabic ASR systems.

The University of Hong Kong — Hong Kong, China
Master Student — *Sept. 2006 – Oct. 2009* [1]

- *Compact Handwriting Recognizer*
  This project developed small-footprint yet high-performance handwriting recognizer for East Asian languages such as Chinese, Japanese and Korean.
- *Large Margin Discriminative Training of Handwriting Recognizer*
  This project aimed to improve the robustness of handwriting recognition systems.

Education

Cambridge University — Cambridge, U.K.
PhD in Information Engineering — *2009 – 2014*

The University of Hong Kong — Hong Kong, China
Master in Computer Science — *2006 – 2009*

University of Science and Technology of China — Hefei, China
Bachelor in Electrical Engineering — *2002 – 2006*

[1] Part of the work was conducted during the internship with Microsoft Research Asia from Sept. 2006 to Oct. 2009.

Awards

- Best industry paper award in International Conference on Document Analysis and Recognition 2009.

Selected Publications

1. X. Chen, X. Liu, Y.-Q. Wang, M. J. F. Gales, and P. C. Woodland. Efficient training and evaluation of recurrent neural network language models for automatic speech recognition. *IEEE Transactions on Audio, Speech and Language Processing (ASLP)*, August 2016.
2. X. Liu, X. Chen, Y.-Q. Wang, M. J. F. Gales, and P. C. Woodland. Two efficient lattice rescoring methods using recurrent neural network language models. *IEEE Transactions on Audio, Speech and Language Processing (ASLP)*, 24(8):1438–1449, August 2016.
3. Y.-Q. Wang and M. J. F. Gales. Speaker and noise factorisation for robust speech recognition. *IEEE Transactions on Audio, Speech and Language Processing (ASLP)*, 20(7), 2012.
4. Y.-Q. Wang and Q. Huo. Modeling inverse covariance matrices by expansion of tied basis matrices for online handwritten chinese character recognition. *Pattern Recognition*, 42(12):3296–3302, 2009.
5. Y.-Q. Wang and Q. Huo. Building compact recognizers of handwritten chinese characters using precision constrained gaussian model, minimum classification error training and parameter compression. *International Journal on Document Analysis and Recognition (IJDAR)*, 14(3):255–262, 2011.
6. Y. Huang, Y.-Q. Wang, and Y. Gong. Semi-supervised training in deep learning acoustic models. In *Proc. Annual Conference of the International Speech Communication (Interspeech)*, 2016.
7. Y.-J. Miao, J. Li, Y.-Q. Wang, S. Zhang, and Y. Gong. Simplifying long short-term memory acoustic models for fast training and decoding. In *Proc. International Conference on Acoustic, Speech, and Signal Processing (ICASSP)*, 2016.
8. C. Liu, Y.-Q. Wang, K. Kumar, and Y. Gong. Investigations on speaker adaptation of lstm rnn models for speech recognition. In *Proc. International Conference on Acoustic, Speech, and Signal Processing (ICASSP)*, 2016.
9. Y.-Q. Wang, J. Li, and Y. Gong. Small-footprint high-performance deep Neural network-based speech recognition using split-VQ. In *Proc. International Conference on Acoustic, Speech, and Signal Processing (ICASSP)*, 2015.
10. P. Karanasou, Y.-Q. Wang, M. J. F. Gales, and P. C. Woodland. Adaptation of deep neural network acoustic models using factorised i-Vectors. In *Proc. Annual Conference of the International Speech Communication (Interspeech)*, 2014.
11. X. Liu, Y.-Q. Wang, X. Chen, M. J. F. Gales, and P. C. Woodland. Efficient lattice rescoring using recurrent neural network language models. In *Proc. International Conference on Acoustic, Speech, and Signal Processing (ICASSP)*, 2014.
12. M. Seltzer, D. Yu, and Y.-Q. Wang. An investigation of deep neural networks for noise robust speech recognition. In *Proc. International Conference on Acoustic, Speech, and Signal Processing (ICASSP)*, 2013.
13. Y.-Q. Wang and M. J. F. Gales. Improving reverberant vts for hands-free robust speech recognition. In *Proc. IEEE workshop on Automatic Speech Recognition and Understanding (ASRU)*, pages 113–118, 2011.
    Best student paper award shortlist
14. Y.-Q. Wang and Q. Huo. Design compact recognizers of handwritten chinese characters using precision constrained gaussian models, minimum classification error training and parameter compression. In *Proc. International Conference on Document Analysis and Recognition*, pages 36–40, 2009.
    Winner of best industry related paper