Yi Luan

CONTACT INFORMATION

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RESEARCH INTERESTS

Machine learning for speech and language processing, deep learning on distributed representation for language modeling.

EDUCATION

University of Washington, Seattle, WA, USA **2013 - present**

Ph.D. Student in Electrical Engineering

- Advisor: Mari Ostendorf
- Co-advisor: Hannaneh Hajishirzi

University of Tokyo, Tokyo, Japan **2011 -2013**

M.Eng. in Electrical Engineering

- Advisor: Nobuaki Minematsu

Harbin Engineering University, Harbin, China **2007 - 2011**

B.Eng. in Electrical Engineering

ACADEMIC EXPERIENCE

University of Washington, Seattle, WA, USA **Sep. 2013 - present**

- **Information extraction on low resource scientific articles**: We intent to extract the key information of scientific papers and categorize them into different aspects. The main problem with information extraction on this domain is lack of annotated data and significant variations in different scientific fields. We introduce a hierarchical neural network and leverage large unlabeled data through multiple semi-supervised learning approaches.
- **Sentence alignment from standard Wikipedia to simple Wikipedia**: Extract the distributed representation of sentences using convolutional neural networks, then align the similar sentences from monolingual parallel corpus with cosine similarity of their distributed representations. The model is evaluated on the parallel articles from Wikipedia and simple Wikipedia.
- **Automatic tagging and recognition of stance**: Isolate the acoustic correlates of stance-taking in speech, develop computational methods that exploit a combination of acoustic and lexical features to detect stance-taking behavior.

University of Tokyo, Tokyo, Japan **Sep. 2011 - Sep. 2013**

- **Noise robust speech recognition**: Extend a non-negative matrix factorization model by adapting noise dictionary to unknown noisy speech with transductive learning. The new model is also robust to noisy speech even without prior knowledge of noise.

Professional Experience

Microsoft Research, Redmond, USA **Jun. 2016 - Sep. 2016**

- **Speaker-role based conversational model**: Build a conversational chatbot which can generate responses based on a person's speaking style and knowledge. We develop a model that doesn't require large personal conversational data but can efficiently capture the person's speaking characteristic. Chatbots of different celebrities were built and being processed to incorporate into products.

Disney Research Lab, Pittsburg, USA **Sep. 2015 - Dec. 2015**

- **Distributed representation for unsupervised event detection**: Propose a model to learn distributed representation of event triggers and event arguments jointly from surrounding context. The model is built on the syntactic structure and could extract the semantic similarity of each component for an event type without any supervision.

Jelinek Summer Workshop , Seattle, USA **Jun. 2015 - Aug. 2014**

- **Continuous Wide-Band Machine Translation**: Utilize contextual information to improve the quality of document-level machine translation. The contextual information is encoded in an entity-grid model extracted from either only source language or both source and target language. For a given source sentence and its translated context, the model is used to select the best candidate from a given n-best hypothesis list in target language.

Mitsubishi Electrical Research Lab, Boston, USA **Jun. 2014 - Sep. 2014**

- **Goal and intention prediction for car navigation system**: A new Multi-scale Recurrent Neural Network structure with multiple recurrent module is proposed for modeling SLU problems such as goal prediction with different time-scale input sequences. This work produces a patent and an Interspeech paper.

Nippon Telegraph and Telephone, Yokosuka, Japan **Feb. 2013 - May. 2013**

- **Target speaker voice activity detection for smart phones**: Develop methods to isolate speech of the target speaker in noisy environments with multiple speakers.

Honors and Awards

- Yamaha Motor International Friendship Scholarship, The University of Tokyo, 2012-2013.
- JASSO Honors Scholarship, The University of Tokyo, 2011-2013.
- Japan Student Services Organization (JASSO) Scholarship, Kitami Institute of Technology, 2009-2010.
- Best graduation thesis, Harbin Engineering University, 2011.
- Best Student Leader Award, Harbin Engineering University, 2008.

Patents

Shinji Watanabe, Yi Luan, Bret Harsham. *Method for using a Multi-Scale Recurrent Neural Network with Pretraining for Spoken Language Understanding Tasks.* Filed in 2015.

Publications

Yi Luan, Chris Brockett, Bill Dolan, Michel Galley, Jianfeng Gao, *Multi-Task Learning for Speaker-Role Adaptation in Neural Conversation Models.* IJCNLP, 2017

Yi Luan, Mari Ostendorf, Hannaneh Hajishirzi, *Scientific Information Extraction with Semi-supervised Neural Tagging.* EMNLP, 2017

Yi Luan, Yangfeng Ji, Hannaneh Hajishirzi, Boyang Li, *Multiplicative Representations for Unsupervised Semantic Role Induction.* ACL, 2016

Yi Luan, Yangfeng Ji, and Mari Ostendorf. *LSTM based Conversation Models.* arXiv preprint arXiv:1603.09457 (2016).

Yi Luan, Shinji Watanabe and Bret Harsham, *Efficient learning for spoken language understanding tasks with word embedding based pre-training.* Interspeech, 2015.

Valerie Freeman, Richard Wright, Gina-Anne Levow, Yi Luan, Julian Chan, Trang Tran, Victoria Zayats, Maria Antoniak, Mari Ostendorf, *Phonetic correlates of stance-taking.* The Journal of the Acoustical Society of America, 2014.

Gina-Anne Levow, Valerie Freeman, Alena Hrynkevich, Mari Ostendorf, Richard Wright, Julian Chan, Yi Luan, and Trang Tran. *Recognition of stance strength and polarity in spontaneous speech.* In Spoken Language Technology Workshop (SLT), 2014.

Yi Luan, Richard Wright, Mari Ostendorf, and Gina-Anne Levow. *Relating automatic vowel space estimates to talker intelligibility.* Interspeech, 2014.

Yi Luan, Daisuke Saito, Nobuaki Minematsu, Keikichi Hirose, *Semi-supervised noise dictionary adaptation for exemplar-based noise robust speech recognition.* IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2014.

Yi Luan, Masayuki Suzuki, Yutaka Yamauchi, Nobuaki Minematsu, Shuhei Kato, Keikichi Hirose, *Performance improvement of automatic pronunciation assessment in a noisy classroom.* IEEE Spoken Language Technology (SLT) 2012.

Skills

- Programming Languages: Python, C++, MATLAB
- Deep learning tools: Theano, cnn
- Languages: Chinese (native), Japanese (fluent), English (fluent)