Lei Shu

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Research Interest

I am expected to graduate at May 2020 and looking for a full-time position in dialogue system, meta learning, deep learning, continual learning, sentiment analysis, natural language understanding generation, and natural language processing.

Conference Publication

[C1] **Lei Shu**, Hu Xu, Bing Liu, Piero Molino. Modeling Multi-Action Policy for Task-Oriented Dialogues. *Submitted to* EMNLP 2019.

[C2] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. Review Conversational Reading Comprehension. *Submitted to* EMNLP 2019.

[C3] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. A Failure of Aspect Sentiment Classifiers and an Adaptive Re-weighting Solution. *Submitted to* EMNLP 2019.

[C4] **Lei Shu**, Piero Molino, Mahdi Namazifar, Bing Liu, Hu Xu, Huaixiu Zheng, Gokhan Tur. Flexibly-Structured Model for Task-Oriented Dialogues. *Submitted to* SIGDIAL 2019.

[C5] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. BERT Post-Training for Review Reading Comprehension and Aspect-based Sentiment Analysis. In: Proceedings of the 2019 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2019).

[C6] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. Open-world Learning and Application to Product Classification. In: Proceedings of the Web Conference 2019 (WWW 2019).

[C7] **Lei Shu**, Piero Molino, Mahdi Namazifar, Bing Liu, Hu Xu, Huaixiu Zheng, Gokhan Tur. Incorporating the Structure of the Belief State in End-to-End Task-Oriented Dialogue Systems. In: NeurIPS 2018 Workshop on Conversational AI.

[C8] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. Double Embeddings and CNN-based Sequence Labeling for Aspect Extraction. In: Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (ACL 2018).

[C9] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. Lifelong Domain Word Embedding via Meta-Learning. In: Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI 2018).

[C10] Hu Xu, Sihong Xie, **Lei Shu**, Philip S Yu. Dual Attention Network for Product Compatibility and Function Satisfiability Analysis. In: Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI 2018).

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Conference Publication

[C11] **Lei Shu**, Hu Xu, Bing Liu. DOC: Deep Open Classification of Text Documents. In: Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing (EMNLP 2017).

[C12] **Lei Shu**, Hu Xu, Bing Liu. Lifelong Learning CRF for Supervised Aspect Extraction. In: Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (ACL 2017).

[C13] Hu Xu, Sihong Xie, **Lei Shu**, Philip S Yu. Product Function Need Recognition via Semi-supervised Attention Network. In: Proceedings of the 2017 IEEE International Conference on Big Data (IEEE BigData 2017).

[C14] Hu Xu, Sihong Xie, **Lei Shu**, Philip S Yu. CER: Complementary Entity Recognition via Knowledge Expansion on Large Unlabeled Product Reviews. In: Proceedings of the 2016 IEEE International Conference on Big Data (IEEE BigData 2016).

[C15] **Lei Shu**, Bing Liu, Hu Xu, Annice Kim. Lifelong-RL: Lifelong Relaxation Labeling for Separating Entities and Aspects in Opinion Target. In: Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing (EMNLP 2016).

[C16] **Lei Shu**, Hu Xu, May Huang. High-speed and accurate laser scan matching using classified features. In: Proceedings of 2013 IEEE International Symposium on Robotic and Sensors Environments (ROSE 2013).

[C17] Hu Xu, **Lei Shu**, May Huang. Planning Paths with Fewer Turns on Grid Maps. In: Proceedings of AAAI Sixth International Symposium on Combinatorial Search (Socs 2013).

Conference Manuscript

[M1] **Lei Shu**, Hu Xu, Bing Liu. Controlled CNN-based Sequence Labeling for Aspect Extraction. arXiv preprint arXiv:1905.06407, 2019.

[M2] **Lei Shu**, Hu Xu, Bing Liu. Unseen Class Discovery in Open-world Classification. arXiv preprint arXiv:1801.05609, 2018.

[M3] Zhaopeng Tu, Yong Jiang, Xiaojiang Liu, **Lei Shu**, Shuming Shi. Generative Stock Question Answering. arXiv preprint arXiv:1804.07942, 2018.

Award

Yelp Dataset Challenge Grand Prize Winner (Round 12)

University of Illinois at Chicago **Graduate Student Presenter Award**

Professional Service

Session Chair	IJCAI 2018 (Dialogue)
PC member	ACL 2019 (Machine Learning and Generation)
	EMNLP 2019 (Information Retrieval and Document Analysis)
	AAAI 2018
Invited Reviewer	IEEE/ACM Transactions on Audio, Speech, and Language Processing (Sentiment Analysis and Dialogue)

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Research Experience

Research Scientist Intern@ Uber AI
Supervisors: Piero Molino, Ph.D. and Gokhan Tur, Ph.D.
Research Topics: Injecting Personality into Task Oriented Dialogue Systems

Research Scientist Intern@ Uber AI Labs
Supervisors: Piero Molino, Ph.D. and Gokhan Tur, Ph.D.
Research Topics: End-to-End Task-oriented Dialogue Systems [C7]
· Propose a novel end-to-end trainable architecture for task-oriented dialogue system.
· Language understanding and state tracking tasks are modeled jointly with a structured copy-augmented sequential decoder and a multi-label decoder for each slot. The copy-augmented sequential decoder deals with new/unknown values in the conversation, while the multi-label decoder combined with the sequential decoder ensures the explicit assignment of values to slots.
· For the response generation, slot binary classifiers are proposed to improve task completion.
· Achieve state-of-the-art performance on the Cambridge Restaurant (CamRest676) and the Stanford in-car assistant(KVRET) datasets.

Research Scientist Intern@ Tencent AI Lab
Supervisors: Shuming Shi, Ph.D and Tong Zhang, Ph.D
Research Topics: Generative Stock Question Answering [M3]
· Study the problem of stock related question answering (StockQA) and release a dataset.
· Design a memory-augmented encoder-decoder architecture, integrating different mechanisms of number understanding and generation, to automatically generate answers (words and numbers) to stock related questions, just like professional stock analysts.

Graduate Research Assistant@ Social Media and Data Mining Lab (SMDM)
Supervisor: Bing Liu, Ph.D
Research Topics: Sentiment Analysis and Deep Learning

Skill

Software Library: *Pytorch, Keras, Tensorflow, gensim, CRFsuite, ROS, OpenCV,*
Programming Language: *Python, C/C++, Java, F#, C#, SQL,*
Tool Language and IDE: *Matlab, IPython, PyCharm, Eclipse, Visual Studio*

Education

University of Illinois at Chicago, Chicago, IL
Ph.D., Computer Science, Expected: **May 2020**.
Supervisor: Bing Liu, Ph.D

University of Science and Technology of China, Hefei, Anhui, China
B.S., Physics

Reference

Bing Liu, Ph.D (Advisor)
Distinguished Professor, Computer Science and Engineering, University of Illinois at Chicago
Fellow of AAAI, ACM, and IEEE.
Three Test-of-Time paper award
ACM SIGKDD Innovation Award
Email: liub@uic.edu
Homepage: `https://www.cs.uic.edu/~liub/`