Lei Shu

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I am interested in dialogue system, meta learning, deep learning, continual learning, sentiment analysis, natural language understanding generation, and natural language processing.

Education

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

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

Experience

Research Scientist Intern@ Uber AI   May 2019 - Aug 2019
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   May 2018 - Aug 2018
Supervisors: Piero Molino, Ph.D. and Gokhan Tur, Ph.D.
Research Topics: End-to-End Task-oriented Dialogue Systems [C2],[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 SOTA on the restaurant (CamRest676) and the in-car assistant(KVRET) datasets.

Research Scientist Intern@ Tencent AI Lab   May 2017 - Aug 2017
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 mechanisms of number understanding and generation, to automatically generate answers (words and numbers) to stock questions, just like professional stock analysts providing action recommendations to stocks upon user's requests.

Graduate Research Assistant@ Social Media and Data Mining Lab   May 2015 - Present
Supervisor: Bing Liu, Ph.D
Research Topics: Sentiment Analysis, Lifelong Machine Learning, Open-world Learning, Meta Learning and Deep Learning [C3]-[C6],[C8]-[C15],[M1],[M2]

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*

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Professional Service

Session Chair	IJCAI 2018 (Dialogue)
PC member	ACL 2019 (Machine Learning and Generation)
	EMNLP 2019 (Information Retrieval and Document Analysis)
	INLG 2019
	AAAI 2020, 2018
Invited Reviewer	IEEE/ACM Transactions on Audio, Speech, and Language Processing
	(Sentiment Analysis and Dialogue)

Award

University of Illinois at Chicago **Graduate Student Presenter Award**
Yelp Dataset Challenge (Round 12) Grand Prize Winner

Conference Publication

[C1] **Lei Shu**, Hu Xu, Bing Liu, Piero Molino. Modeling Multi-Action Policy for Task-Oriented Dialogues. In: Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing (EMNLP 2019).

[C2] **Lei Shu**, Piero Molino, Mahdi Namazifar, Hu Xu, Bing Liu, Huaixiu Zheng, Gokhan Tur. Flexibly-Structured Model for Task-Oriented Dialogues. In: Proceedings of the 20th Annual Conference of the joint ISCA and ACL the Special Interest Group on Discourse and Dialogue (SIGDIAL 2019).

[C3] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. Review Conversational Reading Comprehension. *Under submission.*

[C4] Hu Xu, Bing Liu, **Lei Shu**, Philip S Yu. A Failure of Aspect Sentiment Classifiers and an Adaptive Re-weighting Solution. *Under submission.*

[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.

Reference

Bing Liu, Ph.D (Advisor)
Distinguished Professor
University of Illinois at Chicago
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Three Test-of-Time paper award
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