Peng Qi

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Education & Professional Experiences

JD AI Silicon Valley Lab — Mountain View, CA
Research Scientist — Oct. 2020 – present

Stanford University — Stanford, CA
Doctor of Philosophy, Computer Science — Sep. 2015 – Sep. 2020
- Research Assistant with Stanford Natural Language Processing Group (Advisor: Chris Manning)

Master of Science, Computer Science — Sep. 2013 – Jun. 2015
- Research Assistant with Stanford Artificial Intelligence Laboratory (Advisor: Andrew Ng)

Master of Science, Department of Statistics — Apr. 2016 – Mar. 2017

Tsinghua University — Beijing, China
Research Assistant, State Key Laboratory of Intelligent Technology & Systems (Advisor: Xiaolin Hu) — Jul. 2011 – Jun. 2013
Bachelor of Engineering (magna cum laude), School of Software — Sep. 2008 – Jul. 2012

Publications

(= Equal Contribution)*

[1] Devendra Singh Sachan, Yuhao Zhang, **Peng Qi**, and William L. Hamilton. Do Syntax Trees Help Pretrained Transformers Extract Information? In *The 16th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*, 2021.

[2] **Peng Qi**. Explainable and Efficient Knowledge Acquisition from Text. (Ph.D. Thesis) *Stanford University*, 2020.

[3] **Peng Qi**, Yuhao Zhang, and Christopher D. Manning. Stay Hungry, Stay Focused: Generating Informative and Specific Questions in Information-Seeking Conversations. In *Findings of ACL: EMNLP 2020*, 2020.

[4] **Peng Qi***, Yuhao Zhang*, Yuhui Zhang, Jason Bolton, and Christopher D. Manning. Stanza: A Python Natural Language Processing Toolkit for Many Human Languages. In *Association of Computational Linguistics (ACL), System Demonstrations*, 2020

[5] **Peng Qi**, Xiaowen Lin*, Leo Mehr*, Zijian Wang*, Christopher D. Manning. Answering Complex Open-domain Questions Through Iterative Query Generation. In *2019 Conference on Empirical Methods in Natural Language Processing and 9th International Joint Conference on Natural Language Processing (EMNLP-ICJNLP), 2019.*

[6] Zhilin Yang*, **Peng Qi***, Saizheng Zhang*, Yoshua Bengio, William W. Cohen, Ruslan Salakutdinov, and Christopher D. Manning. HotpotQA: A Dataset for Diverse, Explainable Multi-hop Question Answering. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2018.

[7] Yuhao Zhang*, **Peng Qi***, and Christopher D. Manning. Graph Convolution over Pruned Dependency Trees Improves Relation Extraction. In *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2018.

[8] **Peng Qi***, Timothy Dozat*, Yuhao Zhang*, and Christopher D. Manning. Universal Dependency Parsing from Scratch. In *CoNLL 2018 Shared Task: Multilingual Parsing from Raw Text to Universal Dependencies*, 2018.

[9] Urvashi Khandelwal, He He, **Peng Qi**, and Dan Jurafsky. Sharp Nearby, Fuzzy Far Away: How Neural Language Models Use Context. In *56th Annual Conference of Association of Computational Linguistics (ACL)*, 2018.

[10] **Peng Qi** and Christopher D. Manning. Arc-swift: A Novel Transition System for Dependency Parsing. In *55th Annual Conference of Association of Computational Linguistics (ACL)*, 2017.

[11] Timothy Dozat, **Peng Qi**, and Christopher D. Manning. Stanford's Graph-based Neural Dependency Parser at the CoNLL 2017 Shared Task. *CoNLL 2017 Shared Task: Multilingual Parsing from Raw Text to Universal Dependencies*. First place

[12] Arun Chaganty*, Ashwin Paranjape*, Jason Bolton*, Matthew Lamm*, Jinhao Lei*, Abigail See*, Kevin Clark, Yuhao Zhang, **Peng Qi**, and Christopher D. Manning. Stanford at TAC KBP 2017: Building a Trilingual Relational Knowledge Graph. In *Text Analysis Conference (TAC)*, 2017.

[13] Yuhao Zhang*, Arun Chaganty*, Ashwin Paranjape*, Danqi Chen*, Jason Bolton*, **Peng Qi**, and Christopher D. Manning. Stanford at TAC KBP 2016: Sealing Pipeline Leaks and Understanding Chinese. In *Proceedings or the Text Analysis Conference (TAC) - Knowledge Base Population*, 2016.

[14] Andrew L. Maas, **Peng Qi**, Ziang Xie, Awni Y. Hannun, Daniel Jurafsky, and Andrew Y. Ng. Building DNN Acoustic Models for Large Vocabulary Speech Recognition. *Computer Speech & Language*, 2016.

[15] **Peng Qi** and Xiaolin Hu. Learning nonlinear statistical regularities in natural images by modeling the outer product of image intensities. *Neural computation*, 26(4):693–711, 2014.

[16] Xiaolin Hu, Jianwei Zhang, **Peng Qi**, and Bo Zhang. Modeling response properties of V2 neurons using a hierarchical k-means model. *Neurocomputing*, 134:198–205, 2014.

[17] **Peng Qi**, Shuochen Su, and Xiaolin Hu. Modeling outer products of features for image classification. In *Advanced Computational Intelligence (ICACI)*, 2013.

[18] Xiaolin Hu, **Peng Qi**, and Bo Zhang. Hierarchical k-means algorithm for modeling visual area V2 neurons. In *Neural Information Processing (ICONIP)*, pages 373–381, 2012. Best Paper Award

Preprints

[19] **Peng Qi***, Haejun Lee*, Oghenetegiri "TG" Sido*, and Christopher D. Manning. Retrieve, Rerank, Read, then Iterate: Answering Open-Domain Questions of Arbitrary Complexity from Text. *arXiv preprint arXiv:2010.12527*, 2020.

[20] Ashwin Paranjape*, Abigail See*, Kathleen Knealy, Haojun Li, Amelia Hardy, **Peng Qi**, Kaushik Ram Sadagopan, Nguyet Minh Phu, Dilara Soylu, and Christopher D. Manning. Neural Generation Meets Real People: Towards Emotionally Engaging Mixed-Initiative Conversations. *arXiv preprint arXiv:2008.12348*, 2020.

Honors

Facebook ParlAI Research Award, China's National Scholarship (top 3% university-wide at Tsinghua), Freshman Scholarship (provincial top 10 in college entrance exam), and other merit-based awards from undergrad

Experience

Stanford NLP Group — Jan. 2018 – present

Explainable Multi-hop Question Answering in the Wild (work-in-progress)

- Extending our previous work published at EMNLP 2019 on a method that leverages off-the-shelf information retrieval methods for explainable multi-hop question answering in an open-domain setting
- Improving performance of end-to-end pipeline by finetuning it with sample-efficient reinforcement learning techniques

Facebook AI Research (New York) — Jun. 2017 – Sep. 2017

Learning to Teach through Communication (Mentors: Jason Weston, Douwe Kiela, Kyunghyun Cho)

- Studied emergent teaching behavior of machine learning agents in a constrained communication setting
- Proposed a reinforcement learning-based method for agents to learn to teach
- Implemented the proposed method in ParlAI with positive results on image classification tasks

Contributing Open Source Projects

Stanza (documentation)

- PyTorch implementation of Stanford's full system in the 2018 CoNLL Shared Task on Universal Dependency Parsing from Raw Text
- Includes neural network models for tokenization, part-of-speech tagging, lemmatization, dependency parsing, and NER in 60+ languages with pretrained models available and intuitive Python interface
- Pipelines for syntactic analysis and NER for English-language biomedical text
- Main contributor and maintainer

Universal Dependencies

- Maintainer of the Chinese-GSD treebank and its corresponding version in simplified Chinese
- Simplified the GSD treebank, fixed annotations and segmentation when necessary, engaged in community discussions about annotation standards

ParlAI

- Implemented various features to enable teacher training in ParlAI
- Bugfixes and stability improvements

Caffe

- Implemented a framework for generic solvers
- Implemented Nesterov's Accelerated Gradient solver and AdaGrad solver
- Contributed neuron layers (Leaky ReLU, Mean-variance normalization)
- Compatibility issues / bug fixes for Mac OS

Kaldi

- Contributed the first training recipe for the Fisher/Switchboard mixed speech corpus (the largest speech corpus in use in academia)
- A bug fix for Kaldi's speaker identification for better speaker heldout training

ConvolutionalRBM.m (Owner)

- An implementation of Honglak Lee *et al.*'s convolutional restricted Boltzmann machine model in Matlab, MEX (C++/CUDA)

HuggingFace Transformers

- Bugfixes in various standard example scripts for running BERT for question answering

Teaching & Mentoring

- Invited speaker, LingCon (Fall 2017; gave a tutorial on "Deep Learning for NLP" to high-schoolers participating in a computational linguistics hackathon)
- TA, CS 224D Deep Learning for Natural Language Processing (Spring 2015)
- TA, CS 124 From Languages to Information (Winter 2015)
- TA, CS 145 Introduction to Databases (Summer 2014)
- TA, CS 224S Spoken Language Processing (Spring 2014)
- Project Mentor, CS 224n (Winter 2019, Best Custom Project Report Prize; Winter 2018, Best Custom Project Report Prize; Winter 2017)
- Tutor, CS 145 Introduction to Databases, CS 107 Computer Organization and Systems, CS 245 Database Systems Principles

Service

Area Chair: NAACL 2021

Publicity Chair: NAACL 2021

Program Committee:
2020 EMNLP 2020 (Outstanding Reviewer)
2019 EMNLP-IJCNLP (Outstanding Reviewer), MRQA, ACL, NAACL-HLT
2018 EMNLP (Best Reviewer Award), ACL, CoNLL Shared Task, UDW
2017 ACL
2013 ICACI
Journal: IEEE TNNLS