
Chen Liang

Contact Information

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Research Interests

My current research interest is the integration of machine learning with symbolic system and structured representation, and its applications in natural language understanding and reasoning like semantic parsing and reading comprehension. For example, my latest project designed and implemented a neural network model (Neural Symbolic Machine) to learn to write Lisp programs to answer questions over a large open-domain knowledge base.

Education

- Northwestern University**, Evanston, IL USA Sept 2013 – Present
- *Ph.D candidate*, Department of Computer Science GPA: 3.97
 - Advisor: Kenneth D. Forbus
 - Selected courses: Machine Learning, Probabilistic Graphical Models, Artificial Intelligence, Knowledge Representation and Reasoning, Qualitative Reasoning
- Peking University**, Beijing, China Sept 2009 – June 2013
- *B.S.*, School of Physics GPA: 3.50
 - Selected courses: Algorithms, Compilers, Discrete Mathematics, Computer Systems: A Programmer's Perspective, Programming Language

Academic Experience

- Northwestern University**, Evanston, IL USA
- Research Assistant** Sept 2013 – Present
- Focus on machine learning, natural language processing, knowledge representation, and cognitive modeling
 - Worked on projects in semantic parsing, knowledge base completion and modeling human concept learning
- Teaching Assistant** March 2016 – June 2016
- Taught lectures on deep learning and designed assignments on Backpropagation and Character-RNN for graduate level course Machine Learning
- Teaching Assistant** Sept 2014 – Dec 2014
- Critiqued students' code and held office hours for graduate level course Artificial Intelligence Programming
- Peking University**, Beijing, China
- Research Assistant** Sept 2010 – June 2013
- Data analysis and simulations for cosmology research in C and Matlab

Industrial Experience

Google

Research Intern

June 2016 – Oct 2016

- Designed and implemented Neural Symbolic Machine, a neural program induction model applied to semantic parsing
- First end-to-end neural network model that achieved new state-of-the-art result on learning semantic parsing with weak supervision over Freebase
- Published the work on arXiv (will submit to a main conference next year)

Google

Research Intern

June 2015 – Oct 2015

- Designed and implemented a text similarity model to jointly learn structural alignment and similarity estimation, and achieved state-of-the-art result on a paraphrase identification benchmark
- Published and presented the work in IJCAI-2016

Publications

1. **Liang, C.**, Berant, J., Le, Q., Forbus, K., and Ni, L. *Neural Symbolic Machines: Learning Semantic Parsers on Freebase with Weak Supervision*, *arXiv preprint arXiv:1611.00020*
2. Noraset, T., **Liang, C.**, Birnbaum, L., and Downey, D. *Definition Modeling: Learning to define word embeddings in natural language*, **AAAI-17**, San Francisco, USA, 2017
3. **Liang, C.**, Paritosh, P., Rajendran, V., and Forbus, K. *Learning Paraphrase Identification with Structural Alignment*, **IJCAI-16**, New York City, USA, 2016
4. **Liang, C.** and Forbus, K. *Learning Plausible Inferences from Semantic Web Knowledge by Combining Analogical Generalization with Structured Logistic Regression*, **AAAI-15**, Austin, Texas, USA, 2015
5. **Liang, C.** and Forbus, K. *Constructing Hierarchical Concepts via Analogical Generalization*, **CogSci-14**, Quebec city, Canada, 2014

Side Projects

Prof. Holmes: an Intelligent Course Advisor

- Managed a team of 5 developers to build a website providing course advising service with IBM Watson API

Awards

Todd M. and Ruth Warren Fellowship (2013-2018)

- A competitive 5-year fellowship for top computer science students

Peking University Scholarship (2009-2013)

Skills&Tools

TensorFlow, Python, Lisp/Scheme, Matlab/Octave, C, Linux Shell, LaTeX