Zhe Zeng | Curriculum Vitae

UCLA Engineering VI Room 368, 404 Westwood Plaza, Los Angeles, CA 90095-1596

EDUCATION

University of California, Los Angeles (UCLA) — **Los Angeles, CA**
Ph.D. Student in Computer Science, Advisor: Guy Van den Broeck — *Sept. 2018 – Present*
Focused on Artificial Intelligence and Machine Learning

Ohio State University — **Columbus, OH**
Exchange Student in Mathematics — *Aug. 2016 – Dec. 2016*

Zhejiang University — **Hangzhou, China**
Bachelor of Science in Mathematics with honors — *Sept. 2014 – Jul. 2018*

RESEARCH INTERESTS

My research interests primarily lie in the intersection of Artificial Intelligence and formal methods. The goal of my research is to combine probabilistic and formal verification techniques to deal with both uncertainty as well as relational structure, and to build AI systems that are able to efficiently and reliably make inference and learn from heterogeneous data.

RESEARCH EXPERIENCES

- ***Hybrid Probabilistic Inference with Complex Constraints*** – *published at UAI 2019, ICML 2020*
  - Proposed a search-based solver for Weighted Model Integration (WMI) task that significantly scales up probabilistic inference on hybrid domains, in the presence of logical constraints and arithmetic constraints.
  - Proposed a message-passing based WMI solver being the first WMI solver that can perform inter-query amortization.
  - Proposed an approximate WMI solver based on performing exact inference in relaxed WMI models.
  - Theoretically traced the tractability boundaries of WMI problems with complex constraints with hardness proofs.
- ***Stein-Method based Variational Inference*** – *published at ICML 2018*
  - Proposed a distributed Stein variational gradient descent algorithm for graphical models with convergence analysis.
  - Proposed Stein lower bound for estimating Bayesian optimal risk and applied it to subset selection tasks.

PUBLICATIONS

Zhe Zeng, Paolo Morettin, Fanqi Yan, Antonio Vergari, and Guy Van den Broeck. Scaling up hybrid probabilistic inference with logical and arithmetic constraints via message passing. In *Proceedings of the 37th International Conference on Machine Learning (ICML)*, 2020.

Zhe Zeng, Paolo Morettin, Fanqi Yan, Antonio Vergari, and Guy Van den Broeck. Probabilistic inference with algebraic constraints: Theoretical limits and practical approximations. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020. *Spotlight presentation, acceptance rate 280/9454 = 2.96%.*

Zhe Zeng and Guy Van den Broeck. Efficient search-based weighted model integration. In *Proceedings of the 35th Conference on Uncertainty in Artificial Intelligence (UAI)*, 2019.

Zhe Zeng, Fanqi Yan, Paolo Morettin, Antonio Vergari, and Guy Van den Broeck. Hybrid probabilistic inference with logical constraints: Tractability and message-passing. In *Workshop on Knowledge Representation & Reasoning Meets Machine Learning at Neural Information Processing Systems (NeurIPS)*, 2019.

Dilin Wang, **Zhe Zeng**, and Qiang Liu. Stein variational message passing for continuous graphical models. In *Proceedings of the 36th International Conference on Machine Learning (ICML)*, 2018.

PROFESSIONAL EXPERIENCES

- **Reviewer** for *International Conference on Machine Learning (ICML) 2020*; *Neural Information Processing Systems (NeurIPS) 2020*; *The Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*
- **Teaching Assistant** for Fundamentals of Artificial Intelligence, CS161 at UCLA, fall 2020
- **Research Intern** at Dartmouth College, Advisor: Qiang Liu, 2017

SELECTED AWARDS

- **First-Class Scholarship for Elite Students in Basic Sciences** 2016
- **Excellent Student Award** (top 5 %) 2015, 2016