Kai Sun

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EDUCATION

Cornell University, USA — Aug. 2015 – Present
Ph.D., Computer Science

Shanghai Jiao Tong University, China — Sept. 2011 – June 2015
B.S., Computer Science (ACM Honored Class, Zhiyuan College)
- GPA **3.97**/4.3 (**91.71**/100)
- Rank **1st** in the ACM Honored Class

PUBLICATIONS

- **Kai Sun**, Lu Chen, Su Zhu and Kai Yu. The SJTU System for Dialog State Tracking Challenge 2. 15th Annual SIGdial Meeting on Discourse and Dialogue (SIGDIAL). 2014.
- **Kai Sun**, Lu Chen, Su Zhu and Kai Yu. A Generalized Rule Based Tracker for Dialogue State Tracking. IEEE Spoken Language Technology Workshop (SLT). 2014.
- Su Zhu, Lu Chen, **Kai Sun**, Da Zheng and Kai Yu. Semantic Parser Enhancement for Dialogue Domain Extension with Little Data. IEEE Spoken Language Technology Workshop (SLT). 2014.
- Kai Yu, Lu Chen, Bo Chen, **Kai Sun** and Su Zhu. Cognitive Technology in Task-Oriented Dialogue Systems – Concepts, Advances and Future. Chinese Journal of Computers. 2014. (**Invited paper**)
- Qizhe Xie, **Kai Sun**, Su Zhu, Lu Chen and Kai Yu. Recurrent Polynomial Network for Dialogue State Tracking with Mismatched Semantic Parsers. 16th Annual SIGdial Meeting on Discourse and Dialogue (SIGDIAL). 2015.
- Kai Yu, **Kai Sun**, Lu Chen and Su Zhu. Constrained Markov Bayesian Polynomial for Efficient Dialogue State Tracking. IEEE/ACM Transactions on Audio, Speech and Language Processing (TASLP). 2015.

MANUSCRIPTS

- **Kai Sun**, Qizhe Xie and Kai Yu. Recurrent Polynomial Network for Dialogue State Tracking. Submitted to Dialogue and Discourse (D&D), 2015.
- Kai Yu, Lu Chen, **Kai Sun**, Su Zhu and Qizhe Xie. Evolvable Dialogue State Tracking for Statistical Dialogue Management. Submitted to Frontiers of Computer Science. 2015.

RESEARCH EXPERIENCE

Shanghai Jiao Tong University, Research Assistant
- Assessment of the Academic Impact of Different Countries and Institutions — Dec. 2012 – Jan. 2013
  - *Mentor: John Edward Hopcroft (Cornell University)*
  - Mined researchers' information from DBLP and search engines such as Google Scholar and Microsoft Academic Search.
  - Extracted useful information and assessed the academic impact of different countries and institutions.
- Research on Dialogue Management — June 2013 – Present

- *Mentor: Kai Yu (SJTU Speech Lab)*
- Researched on improving the state of the art in tracking the state of spoken dialogue systems using both rule-based and statistical approaches.
- Proposed two novel frameworks, referred to as *Constrained Markov Bayesian Polynomial (CMBP)* and *Recurrent Bayesian Polynomial (RPN)* respectively for dialogue state tracking.
- Participated in the 2nd Dialog State Tracking Challenge (DSTC-2) and ranked the 3rd.
- Participated in the 3rd Dialog State Tracking Challenge (DSTC-3) where our method was found to be one of the top three tracking methods (ranked 1st/2nd/3rd in "requested slots"/"method"/"joint goals" respectively), and was one of the only two methods that outperformed all four baselines of the challenge.

Cornell University

- Research on Machine Learning July 1, 2014 – July 31, 2014
  - *Specialty Practice organized by John Edward Hopcroft (Cornell University)*
  - Compared the framework with both traditional rule-based approaches and statistical approaches.
  - Refined the theory of *Constrained Markov Bayesian Polynomial (CMBP).*

Microsoft Research Asia, Full-time Intern

- Research on Speech Synthesis Aug. 2014 – Present
  - *Mentors: Frank Soong and Lijuan Wang (MSRA Speech Group)*
  - Built a Recurrent Neural Network (RNN)-based text-to-speech (TTS) synthesis system which supports multi-task learning (MTL).
  - Investigated how to control the age dimension of RNN-based TTS models by applying MTL and matrix decomposition.
  - Studied on handling head stabilization and registration problem of 3D talking head using some computational geometry algorithms and computer vision algorithms such as Iterative Closest Point (ICP).

Self-motivated Research in My Spare Time

- Research on AI in Board Games 2006 – Present
  - Researched on improving the state-of-the-art since the strength of the state-of-the-art professional go-moku/renju programs still cannot outperform the best human player (with modern opening rules).
  - Analyzed the weakness of top go-moku and renju programs and proposed a set of solutions.
  - Designed *Yixin* which became the winner of the 13th, 14th, 15th, 16th Gomocup, significantly outperforming the AI in the second position with a gap of about 300 elo, and has been the strongest go-moku/renju program in the world since 2012.
  - More about Yixin: http://www.aiexp.info/pages/yixin.html

HONORS AND AWARDS

- **University Fellowship**, Cornell University, 2015
- **Excellent Bachelor Thesis (Top 1%)**, Shanghai Jiao Tong University, 2015
- **Zhiyuan Excellent Student Scholarship**, Shanghai Jiao Tong University, 2015 (highest honor in Zhiyuan College)
- **Outstanding Graduate Award**, Shanghai Jiao Tong University, 2015
- **Award of Excellence of MSRA Star of Tomorrow Internship Program**, 2015
- **National Scholarship**, 2014 (highest scholarship in China, awarded to top 1% students)
- **Microsoft Young Fellow Scholarship Award**, 2014 (39 undergraduate&graduate students in China)

- **Google Excellence Scholarship**, 2014 (58 undergraduate&graduate students in China)
- **Shanghai Government Scholarship**, 2013 (1 student in the ACM Honored Class)
- **Chun-Tsung Scholarship**, 2013 (1 student in the ACM Honored Class)
- **Academic Excellence Scholarship (First-Class)**, Shanghai Jiao Tong University, 2012 (awarded to top 1% students)
- **KoGuan Scholarship**, 2012 (55 undergraduate students in SJTU)
- **Winner of the 13th, 14th, 15th, 16th Gomocup**, 2012-2015
- **First Prize**, National High School Math League, 2010
- **Silver Medal**, National Olympiad in Informatics (NOI), 2010

TEACHING EXPERIENCE

- Fall 2012: Teaching Assistant in Introduction to Computer Science (Lecturer)
- Fall 2013: Teaching Fellow in Introduction to Computer Science (Lecturer)
- Spring 2015: Teaching Fellow in Compiler Design and Implementation (Lecturer)