# Lantao Yu

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## Education

**Shanghai Jiao Tong University**                    **Shanghai, China**
*Sep. 2014-Jun. 2018*

- Senior undergraduate, Dept. of Computer Science
- Zhiyuan Honors Program of Engineering (an elite program for top 5% talented students)
- GPA: Overall: 91.30/100 **(Ranking: 3$^{rd}$/151)** | Major: 93.47/100 | Final Year: 93.93/100
- Standard Test: TOEFL: 108 (R30, L29, S23, W26), GRE: V160, Q167, W4.0
- Advisors: Prof. Weinan Zhang, Prof. Yong Yu and Prof. Jun Wang (University College London)

**Carnegie Mellon University**                    **Pittsburgh, USA**
*Aug. 2017-Feb. 2018*

- Research Intern, Institute for Software Research, School of Computer Science
- Advisor: Prof. Fei Fang

## Research Interests

Machine learning in general, including deep learning, representation learning, reinforcement learning, as well as their applications in sequential decision making, generative modeling, natural language understanding, multi-agent systems and data mining.

## Publications (Google Scholar Profile)

**SeqGAN: Sequence Generative Adversarial Nets with Policy Gradient**

- **Lantao Yu**, Weinan Zhang, Jun Wang, Yong Yu.
- In *Proceedings of the 31st AAAI Conference on Artificial Intelligence*. **AAAI 2017.** **(90 citations)**

**A Dynamic Attention Deep Model for Article Recommendation by Learning Human Editors' Demonstration**

- **Lantao Yu**\*, Xuejian Wang\*(equal contribution), Kan Ren, Guanyu Tao, Weinan Zhang, Yong Yu, Jun Wang.
- In *Proceedings of the 23rd SIGKDD Conference on Knowledge Discovery and Data Mining*. **KDD 2017.**

**IRGAN: A Minimax Game for Unifying Generative and Discriminative Information Retrieval Models**

- Jun Wang, **Lantao Yu**, Weinan Zhang, Yu Gong, Yinghui Xu, Benyou Wang, Peng Zhang, Dell Zhang.
- In *Proceedings of the 40th International ACM SIGIR Conference on Research and Development in Information Retrieval*. **SIGIR 2017**. **Best Paper Award Honorable Mention. (10 citations)**

**Deep Reinforcement Learning for Green Security Game with Online Information**

- **Lantao Yu**, Yi Wu, Rohit Singh, Lucas Joppa and Fei Fang.
- In *Workshop on Artificial Intelligence for Imperfect-Information Games at **AAAI 2018***.

**An Empirical Study of AI Population Dynamics with Million-agent Reinforcement Learning**

- **Lantao Yu**\*, Yaodong Yang\*, Yiwei Bai\*(equal contribution), Jun Wang, Weinan Zhang, Ying Wen, Yong Yu.
- In *Workshop on Aligned Artificial Intelligence at **NIPS 2017***.
- Follow-up work submitted to *AAMAS 2018*. Review score: 8, 8, 7 (out of 10)

## Honors and Awards

- **IEEE Special Scholarship** (RMB ¥100,000) (Top 2 students in School of Electronic Information and Electrical Engineering), Shanghai Jiao Tong University. 2017
- **Best Paper Award Honorable Mention (Link)**, SIGIR 2017.
- **Microsoft Azure Research Award**, Carnegie Mellon University. 2017.
- **Scholarship of Excellent Undergraduates** (Top 2 students in School of Electronic Information and Electrical Engineering), Shanghai Jiao Tong University. 2017

- **National Scholarship** (Top 3 students in CS Department), Ministry of Education of P.R.China. 2016.
- **Zhiyuan College Honors Scholarship** (Top 5%), Shanghai Jiao Tong University. 2015 & 2016.
- **Overall GPA Ranking Top 3 out of 151 (Link)** (Sophomore GPA Ranking 1$^{st}$/151), Department of Computer Science, Shanghai Jiao Tong University. 2014-2017.
- **Yuan-Ze Scholarship** (Top 2% in Computer Science Department), Zhiyuan College. 2015.
- **First Prize** in China Undergraduate Mathematical Contest in Modeling, Shanghai Division. 2015

## Research Experiences

### Deep Reinforcement Learning for Security Game with Online Information
*Guide: Prof. Fei Fang, SCS, CMU*                                          *Aug. 2017-Present*
- Generalize Stackelberg Security Games to incorporate the vital online information, which has been previously neglected by the research community, and no existing mathematical programming methods are applicable.
- Proposed a method combining deep reinforcement learning, double oracle algorithm and meta-learning to efficiently approximate the Nash Equilibrium.

### Learning and Planning for Wildlife Security
*Guide: Prof. Fei Fang, SCS, CMU*                                          *Aug. 2017-Present*
- Design machine learning algorithms to predict poaching activities and improve patrolling strategies.
- Deployed by World Wildlife Fund to improve real-world patrolling and featured on Cheddar TV.

### Adversarial Training for Discrete Sequential Data Generation
*Guide: Prof. Weinan Zhang, Prof. Jun Wang, Prof. Yong Yu, CSD, SJTU*          *Jun. 2016-Sep. 2016*
- Proposed a novel framework SeqGAN combining adversarial training and policy gradient algorithm for generating discrete sequential data.
- Accepted as a full paper at *AAAI 2017*. Received **80+ citations**.
- **Included in the deep learning course in University of Waterloo.**
- Successfully applied to dialogue systems, machine translations, image captions and music generation, etc.

### Minimax Framework for Information Retrieval
*Guide: Prof. Jun Wang, Prof. Weinan Zhang, CSD, SJTU*                         *Sep. 2016-Jan. 2017*
- Proposed a minimax framework unifying two major schools of IR methodologies
- Achieved significant performance gains over strong baselines in a variety of tasks including web search, item recommendation, and question answering.
- Accepted as a full paper at *SIGIR 2017*. Won the **Best Paper Award Honorable Mention**.

### Dynamic Attention Deep Model for Article Recommendation
*Guide: Prof. Weinan Zhang, Prof. Jun Wang, Prof. Yong Yu, CSD, SJTU*          *Dec. 2016-Feb. 2017*
- Proposed a hybrid attention-based deep model to capture the editors' dynamic underlying criterion.
- Outperformed strong baselines through a 9-day A/B testing, with more stable and robust predictions.
- Accepted as a full paper at *KDD 2017*, deployed by a commercial article feed platform.

### Emerging Collective Dynamics from Large AI Population
*Guide: Prof. Weinan Zhang, Prof. Jun Wang, Prof. Yong Yu, CSD, SJTU*          *May. 2017-Aug. 2017*
- Designed and developed a platform for large scale Multi-Agent Reinforcement Learning experiments.
- Discovered the ordered collective dynamics from a large population of RL agents driven by self-interest.
- Verified the principles developed in the real world could be applied to understand AI population.

### Detecting Click Fraud in Computational Advertising
*Guide: Prof. Weinan Zhang, Prof. Yong Yu, CSD, SJTU*                         *Jan. 2016-Jun. 2016*
- Apache Spark cluster computing for processing massive data from YOYI Inc.
- Implemented state-of-the-art click fraud detection algorithms on large-scale real world datasets.

### Open Source Projects
- Implementation of SeqGAN. 880+ stars, 300+ forks in Github.
- Implementation of IRGAN. 280+ stars in Github.
- Million-level Multi-Agent Reinforcement Learning Platform.
- Multi-agent Reinforcement Learning Paper Collection. 330+ stars in Github.

**Selected Academic Presentations**

- Sequence Generative Adversarial Networks. AAAI 2017 Conference, San Francisco.
- Generative Adversarial Networks for Discrete Data. Invited talk, at PaperWeekly.
- Adversarial Training for Information Retrieval. Apex Lab, SJTU.

**Review Experience: PIC 2016, SIGIR 2017, TALLIP 2017**