Yanchao Sun

Gender: female

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Education

- **University of Maryland, College Park** Maryland, U.S.A.
  Ph.D. in Computer Science; GPA: 3.95/4 *Sep 2018 – Present*
- **Sichuan University** Chengdu, China
  B.S. in Computer Science and Technology; GPA: 3.9/4 (95/100); Rank: 1/380 *Sep. 2014 – Jun 2018*
- **The Hong Kong Polytechnic University** Hong Kong, China
  Exchange student in Computer Science; GPA: 4/4.5 *Sep. 2016 – Dec. 2016*

Research Experience

- **Research Assistant** University of Maryland, College Park, U.S.A.
  Advisor: Prof. Furong Huang *Jan 2019 – Present*
  - **Online Multi-task Reinforcement Learning Algorithm. (1st author)**
    We are working on a new algorithm for online multi-task learning with lower per-task sample complexity. Existing algorithms usually measure the distances among MDPs and attempt to transfer knowledge between similar MDPs, but they require the MDP space being small. In contrast, our algorithm borrows knowledge from separate components of multiple previous MDPs, so it can be applied to large MDP spaces and work well even the state/action spaces are different.
  - **Spectral methods for model-based reinforcement learning. (1st author)**
    We propose a new reinforcement learning algorithm with a novel exploration strategy and the ability to infer unknown dynamics via spectral methods. We provide theoretical analysis and empirical results, both of which show that our proposed algorithm achieves higher sample and computational efficiency than state-of-the-art approaches.
  - **Multi-task Reinforcement Learning Based on Option Grouping. (course project)**
    We try to expedite the learning of multiple tasks by discovering optimal options (temporally extended actions) for similar historical tasks.
  - **Understanding of Generalization in Deep Learning via Tensor Methods. (2nd author)**
    We propose a highly compressible neural network architecture and derive practical generalization bounds for fully connected networks, convolutional neural networks, and networks with skip connections.
- **Research Assistant Intern** Sichuan University, China
  Advisor: Prof. Ning Yang *Apr 2016 – Jun 2018*
  - **Collaborative Inference of Coexisting Information Diffusions. (1st author)**
    We build a model for coexisting information diffusion networks (for example, the diffusion of multiple topics in Twitter that all happens in a period of time). By using context-aware tensor decomposition with heterogeneous constraints from additional information sources, the model recovers and predicts information diffusion trails with high accuracy.
- **Independent Research** Sichuan University, China
  Advisor: Prof. Yu Chen *Mar 2016 – Nov 2016*
  - **Modified Linear Time Selection Algorithm. (1st author)**
    We improve the selection step of the classic linear time selection algorithm to make it faster.

Papers

1. **Yanchao Sun** and Furong Huang. *"Can Agents Learn by Analogy? An Inferable Model for PAC Reinforcement Learning"*. Accepted by the International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2020). May 2020.
2. Jingling Li, **Yanchao Sun**, Ziyin Liu, Taiji Suzuki and Furong Huang. *"Understanding Generalization in Deep Learning via Tensor Methods"*. Accepted by the 23rd International Conference on Artificial Intelligence and Statistics (AISTATS 2020). June 2020.
3. **Yanchao Sun**, Cong Qian, Ning Yang and Philip S. Yu. *"Collaborative Inference of Coexisting Information Diffusions"*. Proceedings of the IEEE 17th International Conference on Data Mining (ICDM 2017). November 2017.

Selected Projects

- **Online System: Career Explore Club** — Sichuan, China
  Technical Team Leader — *May 2016 – Jun 2018*
  - We developed an online system to help students evaluate themselves and plan their careers. We designed an original algorithm to match a person's personality and majors/occupations. This product is still being used by many students in Sichuan, China.
- **Software: QR Code Beautifier** — Fudan University, China
  Developer — *May 2016 – Dec 2016*
  - This work was inspired by the phenomenon that some QR codes were beautified or distorted to attract people, but scanning programs may have difficulty recognizing them. We did a survey on current QR code recognition algorithms, then developed a tool to recognize beautified QR codes and beautify QR codes without loss of recognizability.
- **Game: Little Droplet** — Sichuan University, China
  Team Leader — *Apr 2016 – Apr 2017*
  - We designed and developed a cross-platform adventure game on the subject of environmental protection.

Selected Awards

- **Dean's Fellowship, University of Maryland, College Park** — *Sep 2018*
- **Outstanding Graduates of Sichuan University** — *Nov 2017*
- **Special Award of Wang Wen Guo Scholarship, Wuyuzhang Honors College** — *Nov 2016*
- **National Endeavor Scholarship, China** — *Nov 2016*
- **The 1st Prize of Blue Bridge Cup National C/C++ Programming Contest, Sichuan Province** — *Mar 2016*
- **National Scholarship, China** — *Nov 2015*
- **The 1st Prize of The Seventh Chinese Mathematics Competitions, Sichuan Province** — *Nov 2015*

Skills

- **Languages**: C/C++, Java, Javascript, PHP, HTML/CSS, Matlab, Scala, Python, SQL
- **Technologies**: Hadoop, Spark, LaTeX