

# Bei Peng

## Education

### Computer Science, Ph.D.

Aug 2013 – Jul 2018

School of Electrical Engineering and Computer Science

Washington State University (WSU), Pullman, WA

Advisor: Dr. Matthew E. Taylor

GPA: 3.89/4.0    Dissertation: Learning from Human Teachers: Supporting How People  
Want to Teach in Interactive Machine Learning

### Computer Science, B.S.

Sep 2008 – Jun 2012

Department of Computer Science

Huazhong University of Science & Technology (HUST, Top 10 in China)

GPA: 3.9/4.0    Ranking (in the department): 16/389

## Research Interests

Interactive Machine Learning, Reinforcement Learning, Curriculum Learning, and Crowdsourcing

## Academic Experience

### Postdoctoral Researcher, Whiteson Research Lab, University of Oxford

Jan 2019 - Present

- Performed research in deep reinforcement learning.

### Research Assistant, IRL Lab, WSU, Pullman, WA

Jan 2014 - Feb 2018

- Performed research in interactive machine learning, mainly investigated how people want to teach and how to better support the ways in which people want to teach the agent.
- Investigated how to design a better representation of the learning agent to elicit a more natural and effective learning interaction between the human trainer and the learner.
- Performed research in curriculum learning, mainly focused on exploring how non-experts design curricula and how we can adapt machine-learning algorithms to take advantage of this guidance.

### Teaching Assistant, WSU, Pullman, WA

Aug 2013 - Dec 2013

- Taught labs and debugged students' programming homework by assembly language.

## Professional Experience

### Research Internship, Microsoft Research, Redmond, WA, U.S.

Oct 2018 - Dec 2018

- Performed research in deep reinforcement learning, mainly focused on developing deep hierarchical RL algorithms to learn interactive fiction games more efficiently.

### Invited Research Talk, Microsoft Research, Redmond, WA, U.S.

Jul 23, 2018

### Research Internship, Borealis AI, Edmonton, AB, Canada

Mar 2018 - Jun 2018

- Performed research in deep learning, mainly focused on developing novel algorithms that are able to learn complex behaviors from online evaluative feedback provided by humans.

### Research Internship, Tencent AI Lab, Bellevue, WA, U.S.

Aug 2017 - Nov 2017

- Performed research in deep learning, mainly focused on exploring how to teach the agent to play the MOBA game KOG using deep supervised learning and reinforcement learning algorithms.

### Front-end Web Developer, Tencent, Wuhan, China

Jun 2012 – May 2013

- Implemented web extensions (e.g., history, bookmark, share micro-blog) and web games (e.g., gravity ball and farm) in mobile platform by JavaScript.

## Publications

### Journal Articles

- Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, and Matthew E. Taylor. Curriculum Design for Machine Learners in Sequential Decision Tasks. *IEEE Transactions on Emerging Topics in Computational Intelligence*, 2018.
- Robert Loftin, Bei Peng, James MacGlashan, Michael L. Littman, Matthew E. Taylor, Jeff Huang,

and David L. Roberts. Learning Behaviors via Human-Delivered Discrete Feedback: Modeling Implicit Feedback Strategies to Speed Up Learning. *Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS)*, pages 1-30, 2015.

### Conference Papers

- James MacGlashan, Mark Ho, Robert Loftin, Bei Peng, Guan Wang, David L. Roberts, Matthew E. Taylor, and Michael L. Littman. Interactive Learning from Policy-Dependent Human Feedback. In *Proceedings of the 34th International Conference on Machine Learning (ICML)*, August 2017. 25% acceptance rate.
- Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, and Matthew E. Taylor. A Need for Speed: Adapting Agent Action Speed to Improve Task Learning from Non-Expert Humans. In *Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2016. 24.9% acceptance rate.
- Robert Loftin, Bei Peng, James MacGlashan, Michael L. Littman, Matthew E. Taylor, David Roberts, and Jeff Huang. Learning Something from Nothing: Leveraging Implicit Human Feedback Strategies. In *Proceedings of the 23rd IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, August 2014.
- Robert Loftin, James MacGlashan, Bei Peng, Michael L. Littman, Matthew E. Taylor, Jeff Huang, and David L. Roberts. A Strategy-Aware Technique for Learning Behaviors from Discrete Human Feedback. In *Proceedings of the 28th AAAI Conference on Artificial Intelligence (AAAI)*, July 2014. 28% acceptance rate.

### Short Conference Papers

- Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, and Matthew E. Taylor. Curriculum Design for Machine Learners in Sequential Decision Tasks (Extended Abstract). In *Proceedings of the 16th International Conference on Autonomous Agents and Multi-agent Systems (AAMAS)*, May 2017. 26% acceptance rate for papers, 22% for extended abstracts.
- Gabriel V. de la Cruz Jr., Bei Peng, Walter S. Lasecki, Matthew E. Taylor. Towards Integrating Real Time Crowd Advice with Reinforcement Learning. In *the 20th ACM Conference on Intelligent User Interfaces (IUI)*, March 2015. 41% acceptance rate for poster submissions.

### Workshop and Symposium Papers

- Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, and Matthew E. Taylor. Curriculum Design for Machine Learners in Sequential Decision Tasks. In *Proceedings of the Adaptive Learning Agents Workshop (at AAMAS)*, May 2017.
- Robert Loftin, James MacGlashan, Bei Peng, Matthew E. Taylor, Michael L. Littman, and David L. Roberts. Towards Behavior-Aware Model Learning from Human-Generated Trajectories. In *AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction*, Nov 2016.
- James MacGlashan, Michael L. Littman, David L. Roberts, Robert Loftin, Bei Peng, and Matthew E. Taylor. Convergent Actor Critic by Humans. In *Workshop on Human-Robot Collaboration: Towards Co-Adaptive Learning Through Semi-Autonomy and Shared Control (IROS)*, Oct 2016.
- Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, and Matthew E. Taylor. An Empirical Study of Non-Expert Curriculum Design for Machine Learners. In *Proceedings of the Interactive Machine Learning Workshop (at IJCAI)*, July 2016.
- Mitchell Scott, Bei Peng, Madeline Chili, Tanay Nigam, Francis Pascual, Cynthia Matuszek, and Matthew E. Taylor. On the Ability to Provide Demonstrations on a UAS: Observing 90 Untrained Participants Abusing a Flying Robot. In *Proceedings of the AAAI Fall Symposium on Artificial Intelligence and Human Robot Interaction AI-HRI*, November 2015.
- Bei Peng, Robert Loftin, James MacGlashan, Michael L. Littman, Matthew E. Taylor, and David L. Roberts. Language and Policy Learning from Human-delivered Feedback. In *proceedings of the Machine Learning for Social Robotics Workshop (at ICRA)*, May 2015.
- Gabriel V. de la Cruz Jr., Bei Peng, Walter S. Lasecki, and Matthew E. Taylor. Generating Real-

Time Crowd Advice to Improve Reinforcement Learning Agents. *In Proceedings of the Learning for General Competency in Video Games workshop (at AAAI)*, January 2015.

- James Macglashan, Michael L. Littman, Robert Loftin, Bei Peng, David Roberts, and Matthew E. Taylor. Training an Agent to Ground Commands with Reward and Punishment. *In Proceedings of the Machine Learning for Interactive Systems workshop (at AAAI)*, July 2014.

## **Awards and Honors**

- WSU EECS Scholarship for Grace Hopper Celebration, 2017
- Travel Award: Grad Cohort for Women Workshop 2014; HCOMP 2014; Grad Cohort for Women Workshop 2015; AAMAS 2016; IJCAI 2016; AAMAS 2017
- National Encouragement Scholarship (1%), HUST, China, 2011
- Model Student of Academic Records (1%), HUST, China, 2010
- Individual Scholarship (5%), HUST, China, 2009

## **Conference and Workshop Presentations**

### **Oral**

- Adaptive Learning Agents (ALA) Workshop at International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), Brazil, 2017.
- Interactive Machine Learning (IML) Workshop at International Joint Conference on Artificial Intelligence (IJCAI), New York City, NY, 2016. ([slides](#))
- International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), Singapore, 2016. ([slides](#)) ([video](#))
- The 10th Barbados Workshop on Reinforcement Learning, Barbados, 2016.
- Machine Learning for Social Robotics Workshop at IEEE International Conference on Robotics and Automation (ICRA) , Seattle, WA, 2015. ([slides](#))

### **Poster**

- International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2017.
- International Joint Conference on Artificial Intelligence (IJCAI) Interactive Machine Learning Workshop, 2016, New York City, NY. ([poster](#))
- International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), 2016, Singapore. ([poster](#))
- WSU GPSA Research Exposition, 2016, Pullman, WA.
- Computing Research Association - CRA-W Grad Cohort Workshop, 2015, San Francisco, CA.
- ACM Conference on Intelligent User Interfaces (IUI), 2015, Atlanta, GA. ([poster](#))
- IEEE International Conference on Robotics and Automation (ICRA) Machine Learning for Social Robotics Workshop, 2015, Seattle, WA.

## **Professional Service**

### **Workshop Organizer**

- Adaptive Learning Agents Workshop (ALA) at AAMAS 2018, 2019

### **Program Committee Member**

- AAMAS 2019
- Adaptive Learning Agents Workshop (ALA) at AAMAS 2017
- First Scaling-Up Reinforcement Learning Workshop (SURL) at ECML PKDD 2017
- First Workshop on the Future of Interactive Learning Machines (FILM) at NIPS 2016

**Reviewer**

- IEEE Geoscience Remote Sensing Letters 2017
- FILM-NIPS 2016, SURL-ECML 2017, ALA-AAMAS 2017