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BEI PENG

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EDUCATION

Computer Science, Ph.D. **Aug 2013 – Jul 2018**
School of Electrical Engineering and Computer Science
Washington State University (WSU), Pullman, WA, U.S.
Advisor: Dr. Matthew E. Taylor
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), Wuhan, Hubei, China

RESEARCH INTERESTS

Deep Reinforcement Learning, Interactive Machine Learning, and Curriculum Learning

RESEARCH EXPERIENCE

Postdoctoral Researcher **Whiteson Research Lab, University of Oxford** **Jan 2019 - Present**

- Performed research in deep multi-agent reinforcement learning, manly focused on developing more sample-efficient deep multi-agent reinforcement learning algorithms for tasks with discrete or continuous actions.
- Performed research in exploration in reinforcement learning, mainly focused on developing new exploration schemes to encourage the agent to explore novel states and actions.
- Supervised PhD students in our lab, undergrad/master students in University of Oxford, and visiting students.

Graduate Research Assistant **IRL Lab, Washington State University** **Jan 2014 - Feb 2018**

- Performed research in interactive machine learning, mainly focused on studying how humans want to teach the agent and how to incorporate the insights into the development of new machine learning algorithms.
- 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 EXPERIENCE

College Lecturer **St Catherine's College, University of Oxford** **Nov 2019 - Present**

- Teaching Artificial Intelligence and Machine Learning.
- Holding admission interviews.

Teaching Assistant **Department of Engineering Science, University of Oxford** **Oct 2019 - Present**

- Class: Reinforcement Learning (10/2020-12/2020, 10/2019-12/2019)

Graduate Teaching Assistant **Washington State University** **Aug 2013 - May 2015**

- Classes: Introduction to Computer Architecture (Fall 2013), Reinforcement Learning (Spring 2015).

PROFESSIONAL EXPERIENCE

Research Internship **Microsoft Research (Redmond)** **Oct 2018 - Dec 2018**

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

Invited Research Talk **Microsoft Research (Redmond)** **Jul 23, 2018**

- Talk: Learning from Human Teachers: Supporting How People Want to Teach in Interactive Machine Learning

Research Internship **Borealis AI (Edmonton)** **Mar 2018 - Jun 2018**

- Performed research in deep reinforcement 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 (Seattle)** **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 (China)** **Jun 2012 – May 2013**

- Implemented web extensions and web games in mobile platform by JavaScript.

PUBLICATIONS

Journal Articles

Sanmit Narvekar, Bei Peng, Matteo Leonetti, Jivko Sinapov, Matthew E. Taylor, Peter Stone. Curriculum Learning for Reinforcement Learning Domains: A Framework and Survey. *Journal of Machine Learning Research (**JMLR**), 2020*.

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

Tonghan Wang, Tarun Gupta, Anuj Mahajan, Bei Peng, Shimon Whiteson, and Chongjie Zhang. RODE: Learning Roles to Decompose Multi-Agent Tasks. *In Proceedings of the 9th International Conference on Learning Representations (**ICLR**), 2021*.

Tabish Rashid, Gregory Farquhar, Bei Peng, Shimon Whiteson. Weighted QMIX: Expanding Monotonic Value Function Factorisation. *In Proceedings of the 34th Conference on Neural Information Systems (**NeurIPS**), 2020*.

Tabish Rashid, Bei Peng, Wendelin Böhmer, Shimon Whiteson. Optimistic Exploration even with a Pessimistic Initialisation. *In Proceedings of the 8th International Conference on Learning Representations (**ICLR**), 2020.*

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**), 2017.*

Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, 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**),2016.*

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**), 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**), 2014.*

Short Conference Papers

Bei Peng, James MacGlashan, Robert Loftin, Michael L. Littman, David L. Roberts, 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 Multiagent Systems (**AAMAS**), 2017.*

Gabriel V. de la Cruz Jr., Bei Peng, Walter S. Lasecki, Matthew E. Taylor. Towards Integrating Real Time Crowd Advice with Reinforcement Learning. *In proceedings of the 20th ACM Conference on Intelligent User Interfaces (**IUI**), 2015.*

Workshop and Symposium Papers

Bozhidar Vasilev, Tarun Gupta, Bei Peng, Shimon Whiteson. Semi-On-Policy Training for Sample Efficient Multi-Agent Policy Gradients. *In Proceedings of the Adaptive and Learning Agents Workshop (at AAMAS), 2021.*

Leo Feng, Luisa Zintgraf, Bei Peng, Shimon Whiteson. VIABLE: Fast Adaptation via Backpropagating Learned Loss. *In Proceedings of the 3rd Workshop on Meta-Learning (at NeurIPS), 2019.*

Tabish Rashid, Bei Peng, Wendelin Bohmer, and Shimon Whiteson. Optimistic Exploration with Pessimistic Initialization. *In Proceedings of the Exploration in Reinforcement Learning Workshop (at ICML), 2019.*

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), 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, 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 (at IROS*), 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), 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, 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), 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), 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), 2014.*

Preprints

Christian A. Schroeder de Witt*, Bei Peng*, Pierre-Alexandre Kamienny, Philip H. S. Torr, Wendelin Böhmer, and Shimon Whiteson. Deep Multi-Agent Reinforcement Learning for Decentralized Continuous Cooperative Control. *arXiv preprint arXiv:2003.06709, 2020.*

Shariq Iqbal, Christian A. Schroeder de Witt, Bei Peng, Wendelin Böhmer, Shimon Whiteson, and Fei Sha. AI-QMIX: Attention and Imagination for Dynamic Multi-Agent Reinforcement Learning. *arXiv preprint arXiv: 2006.04222, 2020.*

Tarun Gupta, Anuj Mahajan, Bei Peng, Wendelin Böhmer, and Shimon Whiteson. UneVEn: Universal Value Exploration for Multi-Agent Reinforcement Learning. *arXiv preprint arXiv:2010.02974, 2020.*

AWARDS AND HONORS

- WSU EECS Scholarship for Grace Hopper Celebration, 2017
- Travel Award: AAMAS 2016, 2017; IJCAI 2016; Grad Cohort for Women 2014, 2015; HCOMP 2014
- 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 Workshop (ALA) at International Conference on Autonomous Agents and Multi-agent Systems (AAMAS), Brazil, 2017.
- Interactive Machine Learning 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 (MLSR) at IEEE International Conference on Robotics and Automation (ICRA) , Seattle, WA, 2015. (slides)

Poster

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

- IEEE International Conference on Robotics and Automation (ICRA) Machine Learning for Social Robotics Workshop, Seattle, WA, 2015.

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, 2021
- 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

- JMLR 2021, NeurIPS 2020, JAIR 2020, AAAI 2020, NeurIPS 2020, AAMAS 2019
- IEEE Geoscience Remote Sensing Letters 2017, ALA-AAMAS 2017, 2018, 2019, SURL-ECML 2017, 2019, FILM-NIPS 2016.