Aijun Bai

Researcher, Microsoft Cloud & AI
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Experience

Microsoft, Cloud & AI, Redmond, WA, United States, 2017.5 - present
Position: Researcher
Project: Cognition intelligence

University of California at Berkeley, EECS, Berkeley, CA, United States, 2015.4 - 2017.5
Position: Postdoctoral Researcher
Project: Hierarchical decision-making and reinforcement learning
Adviser: Prof. Stuart Russell

Carnegie Mellon University, CSD, Pittsburgh, PA, United States, 2013.12 - 2015.3
Position: Visiting Research Scholar
Project: Human-robot interaction and multi-object tracking
Adviser: Prof. Manuela Veloso and Prof. Reid Simmons

University of Science and Technology of China, CSD, Hefei, Anhui, China, 2009.9 - 2014.11
Position: Research Assistant
Project: Hierarchical decision-making in RoboCup domains
Adviser: Prof. Xiaoping Chen

Education

University of Science and Technology of China, Hefei, Anhui, China, 2009.9 - 2014.11
Ph.D. in Computer Science, advised by Prof. Xiaoping Chen

University of Science and Technology of China, Hefei, Anhui, China, 2005.9 - 2009.6
B.E. in Computer Science

Research Interests

Decision-theoretic Planning, Reinforcement Learning, Deep Learning, Computer Vision and Robotics

Publications

[1] **Aijun Bai**, Feng Wu, and Xiaoping Chen. Posterior sampling for monte carlo planning under uncertainty. *Applied Intelligence (AI)*, 2018.

[2] Mikhail Prokopenko, Peter Wang, Sebastian Marian, **Aijun Bai**, Xiao Li, and Xiaoping Chen. RoboCup 2d soccer simulation league: Evaluation challenges. In *RoboCup-2017: Robot World Cup XX*, Lecture Notes in Computer Science. Springer, 2017.

[3] **Aijun Bai**, Reid Simmons, and Manuela Veloso. Multi-Object tracking and identification via particle filtering over sets. In *2017 20th International Conference on Information Fusion, FUSION 2017*, Xi'an, P.R. China, July 2017.

[4] **Aijun Bai**, Stuart Russell, and Xiaoping Chen. Concurrent hierarchical reinforcement learning for RoboCup Keepaway. In *RoboCup-2017: Robot World Cup XX*, Lecture Notes in Computer Science. Springer, 2017.

[5] **Aijun Bai** and Stuart Russell. Speeding up HAM learning with internal transitions. In *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making, RLDM 2017, Ann Arbor, Michigan, USA, June 11-14*, 2017.

[6] **Aijun Bai** and Stuart Russell. Efficient reinforcement learning with hierarchies of machines by leveraging internal transitions. In *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence, IJCAI 2017, Melbourne, Australia, August 19-26, 2017*, pages 1418–1424, 2017.

[7] **Aijun Bai**, Siddharth Srivastava, and Stuart Russell. Markovian state and action abstractions for MDPs via hierarchical MCTS. In *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, IJCAI 2016, New York, NY, USA, 9-15 July 2016*, pages 3029–3039, 2016.

[8] Zongzhang Zhang, David Hsu, Wee Sun Lee, Zhan Wei Lim, and **Aijun Bai**. PLEASE: palm leaf search for POMDPs with large observation spaces (extended abstract). In *Proceedings of the Eighth Annual Symposium on Combinatorial Search, SOCS 2015, 11-13 June 2015, Ein Gedi, the Dead Sea, Israel.*, pages 238–240, 2015.

[9] Zongzhang Zhang, David Hsu, Wee Sun Lee, Zhan Wei Lim, and **Aijun Bai**. PLEASE: palm leaf search for POMDPs with large observation spaces. In *Proceedings of the Twenty-Fifth International Conference on Automated Planning and Scheduling, ICAPS 2015, Jerusalem, Israel, June 7-11, 2015.*, pages 249–258, 2015.

[10] **Aijun Bai**, Feng Wu, and Xiaoping Chen. Online planning for large Markov decision processes with hierarchical decomposition. *ACM Transactions on Intelligent Systems and Technology (TIST)*, 6(4):45:1–45:28, Jul 2015.

[11] **Aijun Bai**, Feng Wu, Zongzhang Zhang, and Xiaoping Chen. Thompson sampling based Monte-Carlo planning in POMDPs. In *Proceedings of the Twenty-Fourth International Conference on Automated Planning and Scheduling, ICAPS 2014, Portsmouth, New Hampshire, USA, June 21-26, 2014*, 2014.

[12] **Aijun Bai**, Reid Simmons, Manuela Veloso, and Xiaoping Chen. Intention-aware multi-human tracking for human-robot interaction via particle filtering over sets. In *AAAI Fall Symposium Series*, 2014.

[13] Qiang Lu, Guanghui Lu, **Aijun Bai**, Dongxiang Zhang, and Xiaoping Chen. An intelligent service system with multiple robots. In *Robot Competition of International Joint Conference on Artificial Intelligence, IJCAI 2013*, Beijing, China, 2013.

[14] **Aijun Bai**, Feng Wu, and Xiaoping Chen. Bayesian mixture modelling and inference based Thompson sampling in Monte-Carlo tree search. In C. J. C. Burges, L. Bottou, M. Welling, Z. Ghahramani, and K. Q. Weinberger, editors, *Advances in Neural Information Processing Systems (NIPS) 26*, pages 1646–1654. Curran Associates, Inc., 2013.

[15] **Aijun Bai**, Feng Wu, and Xiaoping Chen. Towards a principled solution to simulated robot soccer. In Xiaoping Chen, Peter Stone, Luis Enrique Sucar, and Tijn van der Zant, editors, *RoboCup-2012: Robot Soccer World Cup XVI*, volume 7500 of *Lecture Notes in Computer Science*, pages 141–153. Springer, 2012.

[16] **Aijun Bai**, Feng Wu, and Xiaoping Chen. Online planning for large MDPs with MAXQ decomposition (extended abstract). In Wiebe van der Hoek, Lin Padgham, Vincent Conitzer, and Michael Winikoff, editors, *International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2012, Valencia, Spain, June 4-8, 2012 (3 Volumes)*, pages 1215–1216. IFAAMAS, 2012.

[17] **Aijun Bai**, Feng Wu, and Xiaoping Chen. Online planning for large MDPs with MAXQ decomposition. In *Proc. of the Autonomous Robots and Multirobot Systems workshop (at AAMAS 2012)*, Jun 2012.

[18] **Aijun Bai**, Xiaoping Chen, Patrick MacAlpine, Daniel Urieli, Samuel Barrett, and Peter Stone. WrightEagle and UT Austin Villa: RoboCup 2011 simulation league champions. In Thomas Röfer, Norbert Michael Mayer, Jesus Savage, and Uluc Saranli, editors, *RoboCup-2011: Robot Soccer World Cup XV*, volume 7416 of *Lecture Notes in Computer Science*, pages 1–12. Springer, 2011.

Honors and Awards

World Champion of Soccer Simulation 2D, RoboCup 2013, Eindhoven, The Netherlands, Jul 2013.

Champion of Soccer Simulation 2D, RoboCup China Open 2012, Hefei, China, Dec 2012.

First Place of Soccer Simulation 2D Free Challenge, RoboCup 2012, Mexico City, Mexico, Jun 2012.

Second Place of Soccer Simulation 2D, RoboCup 2012, Mexico City, Mexico, Jun 2012.

Champion of Soccer Simulation 2D, RoboCup China Open 2011, Lanzhou, China, Aug 2011.

World Champion of Soccer Simulation 2D, RoboCup 2011, Istanbul, Turkey, Jul 2011.

Champion of Soccer Simulation 2D, RoboCup China Open 2010, Ordos, China, Jul 2010.

Second Place of Soccer Simulation 2D, RoboCup 2010, Singapore, Singapore, Jul 2010.

Champion of Soccer Simulation 2D, RoboCup China Open 2009, Dalian, China, Nov 2009.

World Champion of Soccer Simulation 2D, RoboCup 2009, Graz, Austria, Jun 2009.

Second Place of Soccer Simulation 2D, RoboCup China Open 2008, Zhongshan, China, Dec 2008.

Second Place of Soccer Simulation 2D, RoboCup 2008, Suzhou, China, Jul 2008.

Champion of Soccer Simulation 2D, RoboCup China Open 2007, Jinan, China, Oct 2007.

Scholarships

Early Researcher Support of ICAPS, 2014.

Travel Award of NIPS Foundation, 2013.

Glarun Scholarship of CETC-14, 2013.

Scholarship of China Scholarship Council (CSC), 2013.

Kwang-Hua Scholarship of USTC, 2012.

Aegon-Industrial Responsibility Scholarship of USTC, 2012.

Outstanding Student Scholarship of USTC, 2006, 2007, 2008.

Outstanding Freshman Scholarship of USTC, 2005.

Professional Services

Reviewer: AAMAS 2011-2013;2017, Agent CN 2012, AAAI 2012;2015, RoboCup 2012-2014, IAS 2013;2014, ACCV 2018, IEEE Intelligent Systems, Artificial Life and Robotics, Autonomous Robots

Programme Committee: IJCAI 2015-2018, AAAI 2016-2019, RLDM 2017

Organizing Committee: RoboCup 2012;2013, RoboCup China Open 2007-2012

Technical Committee: RoboCup 2011, RoboCup China Open 2007-2012

Qualifications

Strong research and engineering skills

Rich **artificial intelligence**, **machine learning** and **robotics** experience

Excellent interpersonal, communicating, writing, analytical and research skills

Reliable, versatile, cooperative, good team member or independent worker

Technical Skills

Proficiency in C/C++, Python, BASH and Java languages

Rich Linux/UNIX, PyTorch, Tensorflow, Keras, OpenCV and ROS experience

Expertise on planning, (deep) reinforcement learning and (deep) machine learning