

# Aijun Bai

Principal Applied Scientist, Microsoft AI & Research   Email: [aijun.bai@microsoft.com](mailto:aijun.bai@microsoft.com)  
Sunnyvale, CA 94089   Homepage: <https://aijunbai.github.io/>

## Experience

**Microsoft**, AI & Research, Sunnyvale, CA, United States, 2018.10 - present

Position: Principal Applied Scientist  
Project: Bing search core relevance

**Microsoft**, Cloud & AI, Redmond, WA, United States, 2017.5 - 2018.10

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

## 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.

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

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

## Scholarships

Early Researcher Support of ICAPS, 2014.

Travel Award of NIPS Foundation, 2013.

## Professional Services

**Reviewer:** AAMAS 2011-2013;2017, Agent CN 2012, AAAI 2012;2015, RoboCup 2012-2014, IAS 2013;2014, ACCV 2018, CVPR 2019, IEEE Intelligent Systems, Artificial Life and Robotics, Autonomous Robots

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

## 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

Last updated: May 15, 2023