

# WrightEagle

## Soccer Simulation 2D

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## Introduction

WrightEagle 2D Soccer Simulation Team was established in 1998. It is a branch of WrightEagle RoboCup Team, which was the first Chinese team that ever participated in international RoboCup events.

## Team Members

Professor: Xiaoping Chen

Students: Ke Shi, Aijun Bai, Guanghui Lu, Yuhang Wang, Yuanchong Zhu, Haochong Zhang, Feng Wu

## History Results

2009: <b>1st place</b> , RoboCup, Graz, Austria;	<b>1st place</b> , RoboCup China Open, Dalian China
2008: <b>2nd place</b> , RoboCup, Suzhou, China;	<b>2nd place</b> , RoboCup China Open, Zhongshan China
2007: <b>2nd place</b> , RoboCup, Atlanta, USA;	<b>1st place</b> , RoboCup China Open, Jinan, China
2006: <b>1st place</b> , RoboCup, Bremen, Germany;	<b>1st place</b> , RoboCup China Open, Suzhou, China
2005: <b>2nd place</b> , RoboCup, Osaka, Japan;	<b>1st place</b> , RoboCup China Open, Changzhou, China

## Research Work

1. We model the proximal dribble problem with ADMDP[1], special framework of MDPs and solve it by using some variant of the value iteration algorithm. The empirical result shows that the new algorithm is better than the old ones with respect to the dribble successful probability, the dribble speed and the run time performance.
2. An A-star based heuristic search algorithm, with some special pruning methods, is adapted to solve the dash problem. According to empirical results, this algorithm can find a better solution than the original greedy algorithms in the case of more than 30 percent.
3. We have developed a new dynamic formation system with smart role changing mechanism, which has the ability to anti-mark and re-assign heterogeneous player type according the opponent's heterogeneous type distribution.
4. The key challenges in robot soccer domains are the huge state and policy space, the limited resource like time and communication channel, and the requirement of tightly-coupled cooperation and coordination. Our theoretical research work formally addressed these challenges and proposed several novel solutions with both theoretical and practical significances [2, 3, 4, 5].

## Publications

- [1] Ke Shi and Xiao-ping Chen, Action-Driven Markov Decision Process and its Application in RoboCup, Journal of Chinese Computer Systems (to appear).
- [2] Feng Wu, Shlomo Zilberstein, and Xiaoping Chen, Rollout Sampling Policy Iteration for Decentralized POMDPs, Proceedings of the 26th Conference on Uncertainty in Artificial Intelligence (UAI-10), Catalina Island, CA, USA, July 2010.
- [3] Feng Wu, Shlomo Zilberstein, and Xiaoping Chen, Trial-Based Dynamic Programming for Multi-Agent Planning, Proceedings of the 24th AAAI Conference on Artificial Intelligence (AAAI-10), Atlanta, GA, USA, July 2010.
- [4] Feng Wu, Shlomo Zilberstein, and Xiaoping Chen, Point-Based Policy Generation for Decentralized POMDPs, Proceedings of the 9th International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS-10), Toronto, Canada, May 2010.
- [5] Feng Wu, Shlomo Zilberstein, and Xiaoping Chen, Multi-Agent Online Planning with Communication, Proceedings of the 19th International Conference on Automated Planning and Scheduling (ICAPS-09), Thessaloniki, Greece, September 2009.



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