

Iranians 2003 Coach Description

Hamed Mousavian, Navid Hamed Azimi, Mohammad Reza Zakery Nasab
mousavian@iust.ac.ir, {futurethinking, zakery}@mail.iust.ac.ir

Computer Engineering Department, Iran University of Science and Technology

Player agents in *simulated robotic soccer* act on the basis of uncertain knowledge and have single-channel, low-bandwidth, unreliable communication with each other [1]. In such an environment, the *coach* client that receives exact information about the field and can communicate with players reliably helps them to coordinate and cooperate. The coach receives complete information about the field from the *SoccerServer* and can advice players in a specified language; *CLang* [2].

To advice players in an adversarial environment like Robocup simulation league, an appropriate opponent model is needed. To achieve that, we are working on clustering opponent team *formations* [3, 4] according to the player's presence in different regions of the field. These informations assist our coach for selecting a suitable formation to counter with opponent team in each situation and suggesting players to use specific regions of the field. Also we considered the problem of recognizing the sequential behavior of opponent team players [5]. This knowledge helps the coach to anticipate opponent players' behaviors and find appropriate rules to counter them.

Our coach has a set of predefined *plans* each have pre-conditions and post-conditions. During the game, when it finds that a plan is suitable for execution, it sends appropriate advice in the form of *CLang* to the players. Another issue we concerned while designing a simulated soccer coach, is the development of a coachable team. We are currently working to make extensions to the architecture of our player agents, to have coachable player agents that also act autonomously.

References

1. Stone, P., Veloso, M.: Task Decomposition, Dynamic Role Assignment, and Low-Bandwidth Communication for Real-Time Strategic Teamwork. In *Artificial Intelligence*, volume 100, number 2, June 1999.
2. Chen, M., Dorer, K., Foroughi, E., Heintz, F., Huang, Z., Kapetanakis, S., Kostiadis, K., Kummeneje, J., Murray, J., Noda, I., Obst, O., Riley, P., Steffens, T., Wang, Y., Yin, X. Robocup Soccer Server User Manual: for SoccerServer 7.07 and later, 2002. At <http://sourceforge.net/projects/sserver>.
3. Recognizing Formations in Opponent Teams. In: Stone, P., Balch, T., Kraetzschmar, G., editors, *RoboCup-2000: Robot Soccer World Cup IV*, pages 327-332. Springer-Verlog, 2001.
4. Riley, P., Veloso, M., Kaminka, G.: An Empirical Study of Coaching. In: *Proceedings of Distributed Autonomous Robotic Systems 6*, Springer-Verlag, 2002.
5. Kaminka, G., Fidanboyly, M., Chang, A., Veloso, M.: Learning the Sequential Coordinated Behavior of Teams from Observations. In Kaminka, G., Lima, P., Rojas, R., editors, *RoboCup-2002: Robot Soccer World Cup VI*. Springer-Verlog, 2003 (forthcoming).