Scenario based teamworking

Ali Ajdari Rad, and Navid Qaragozlou
Aliar007@yahoo.com, q_navid@yahoo.com

Computer Engineering Faculty, Amir Kabir University of Technology, Tehran, Iran

pasargad@ce.aku.ac.ir
http://www.aku.ac.ir/robocup/pasargad

Abstract. In the similar way of a real soccer team, the robot teams can have a coach. The duty of the coach is to employ appropriate tactics based on abilities of teammates and also the strategy of the opponents. Furthermore, it is responsible to find the drawbacks of its own team and improve their teamwork by applying appropriate strategies.
In this abstract paper we present some features of Pasargad standard coach client that coaches a soccer team of robots for Robocup 2002. Pasargad coach uses special circular-layered architecture, called Pasargad architecture. This architecture gives our coach the ability of analysis and present instructions in different abstract levels. The novel feature of Pasargad coach is a method for multi agent team modeling and planning, called Scenario based teamworking (SBT).
A scenario is a set of frames which has triggers (data triggers, time trigger, communication triggers, task triggers, and situation triggers), actions (a high level instruction for an agent), and abort conditions (like triggers but in negative meaning). Sequence of frames represents a local tactic. Also each scenario has evaluation parameters (costs and scores), goals (like scoring or play in width), and side effects (like speed the game). The 'Can occur after' relation makes a direct graph of existing scenarios. A path from scenarios with 'Ball Clearance' goal to scenarios with 'Scoring' goal will plan an attacking strategy. The coach changes the evaluation parameters of each scenario an updates the weight of graph edges during a game depends on success or fail of scenarios or paths. In real game players select scenarios depends on global team goals, scenario evaluation parameters and weights of edges of graph. Scenario concept gives Pasargad coach the ability of high level opponent modeling, learns new strategies from opponents or makes new strategies automatically. In defense mode, Pasargad coach acts like other teams.
Defining scenario concept with coach standard language is the main work of Pasargad team till world cup games.