Sharif-Arvand Coach

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In *Sharif-Arvand* soccer simulator team, we have designed and implemented an online coach, which is able to analyze the simulated match similar to a coach in a real football match, and sends commands to its players to improve their behaviors and get a better result from the match process. This coach has been the 1^{st} place of Seattle'2001 RoboCup world championship in the field of online coaches. *Sharif-Arvand*'s coach has the following abilities:

- Using heterogeneous players
- Recognizing the skills of players:
  - Owning the ball
  - Kicking the ball
  - Passing and intercepting the ball
  - Dribbling
- Exchanging roles among players
- Substituting 3 players during the match
- Gathering game statistics
  - Ball's average position and its variance
  - Each player's average position and its variance
  - Average position of all of team's players taken as a whole
  - Number of goal, corner, offside and ball-out situations
  - Number of shoots towards the opponent goal
  - Number of successful ball passes and ball interceptions
  - Number of goals which each player has scored
- Recognizing the opponent formation
- Modifying the formation of players
- Analyzing the match based on Voronoi diagram

In the development of our online coach, we used different algorithms for different purposes. For example, to recognize the opponent formation, we used a Self Organizing Map (SOM) neural network which is capable of recognizing the opponent formation during the match and based on this analysis, our coach is able to send appropriate commands to its players.