Multi-Robot Coordination Strategy for 3 vs. 3 Teen-sized Humanoid Robot Soccer Game

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Abstract

This paper proposes a multi-robot coordination strategy system concerning 3 vs. 3 teen-sized humanoid robot soccer game.

- Three main technologies in the system:
  - **Self-localization:** We figure out the initial position of the robot and update the position by the value of the Inertial Measurement Unit (IMU) and the estimate movement distance.
  - **Object recognition:** Because the line, ball, and goal posts are colored white, we utilize the contour features to recognize them and calculate their positions in robot coordinate. Hence, suppose the robot position in the world coordinate is known, the position of the line, ball, and goal posts in world coordinate can be determined.
  - **Coordination strategy:** Every robot transmits its location and his own information to the central control player to construct a global map used to generate a suitable strategy and to assign roles.

- The simulations show the strategy is effective of the proposed coordination strategy.