



Providing a Coaching Interface for the Nao Robots Using a Microsoft Kinect

Motivation and Contribution

The goal of RoboCup is to produce fully autonomous soccer teams, but no team is complete without a coach. With the addition of a coach, RoboCup teams would be closer to reality. Even the most advanced robotic soccer players do not possess the strategic thinking and instincts of a human, but with the advice of a human coach, the robot players could someday learn these skills. Thus, we at UPenn were inspired to implement a human-computer coaching interface to allow a human to provide coaching advice for the Naos in the form of gestures.

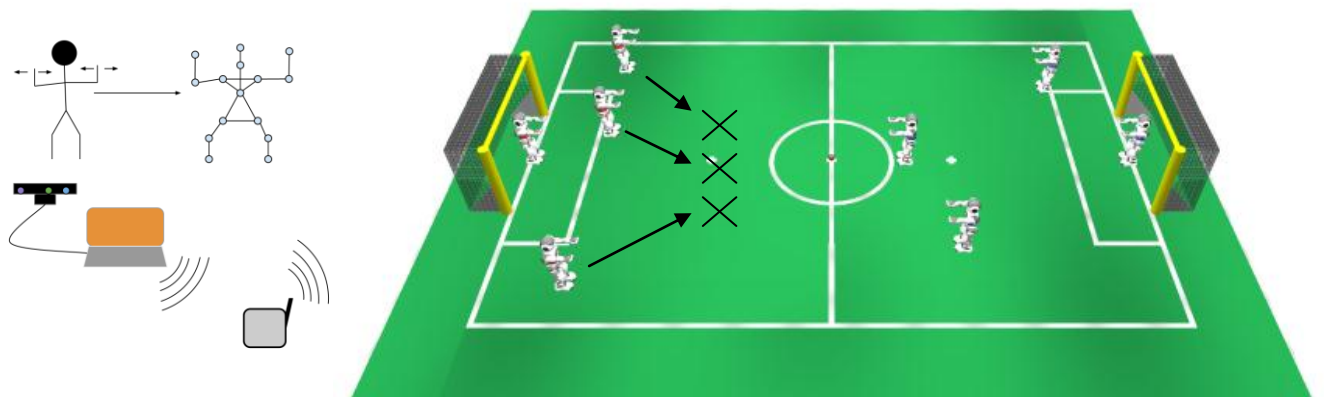
Implementation

In order to interpret the coach's gestures, we utilize a Microsoft Kinect, using OpenNI and NITE for skeleton tracking. We process the skeletal information on a laptop, search for certain sequences of body motions, and issue coaching messages to the Naos accordingly.

The Naos receive the coaching messages via wireless and execute the indicated gameplay strategies. The coaching merely guides the Naos; the robots themselves decide on the specific execution of a gameplay strategy. The players use factors such as localization data, body state, player role, and game state to determine how to perform a particular strategy, or if that strategy is even possible under the current circumstances.

Demonstration

The demonstration of our human-computer coaching interface will involve a base station consisting of a laptop computer and Kinect, communicating via wireless with a team of Naos on the field. Players on the field will receive coaching advice and will react accordingly.



Nao players forming a wall according to coaching gestures.