

Noxious-Kouretes 2011 SPL Open Challenge

Unconventional Ball Kicks with the Nao

E. Chatzilaris³, I. Kyranou³, J. Ma², E. Orfanoudakis³, A. Panakos¹,
A. Paraschos¹, G. Pierris¹, N. Spanoudakis³, J. Threlfall¹, A. Topalidou³,
D. Tzanetatou³, E. Vazaios³, S. Cameron², T. Dahl¹, M. G. Lagoudakis³

¹ Cognitive Robotics Research Center (CRRC), University of Wales, Newport, UK

crrc.newport.ac.uk

² Computing Laboratory (ComLab), Oxford University, Oxford, UK

www.comlab.ox.ac.uk

³ Intelligent Systems Laboratory, Technical University of Crete, Chania, Greece

www.kouretes.gr

Motivation

The Standard Platform League (SPL) is still missing several elements of real soccer games. In RoboCup 2010 Open Challenge, team Kouretes presented a goal keeper punt kick, whereby the goal keeper lowers his body, grabs the ball with his hands, stands up while holding the ball, drops the ball, and kicks it back into the game. Later, team Wright Eagle presented an improved punt kick able to send the ball several meters away. It will not be surprising to see this kind of kick used routinely in SPL games from RoboCup 2011 on.

Description

Conventional kicks with the Nao typically include the following phases: approach the ball, stop when really close, stand on one leg, kick the ball with the other leg. In this year's Open Challenge we plan to present two unconventional kicks with the Nao. The punt kick was a first attempt to lift the SPL ball off the SPL field, but for making SPL a real 3D game, field players must also be able to kick the ball off the floor. The *high kick*, as we call it, is a sophisticated action that enables the Nao to score goals by sending the ball even over the goal keeper's head! This kick is achieved without any hardware modification or attachment and without grabbing the ball with the hands. The *projection kick*, as we call it, aims at allowing kicking of a moving ball. The robot tracks the ball in terms of position and velocity, predicts its trajectory, and executes the kick, if a chance for impact is foreseen. This procedure is supported by our new perception module that filters out noise and temporary observation losses in visual ball recognition. Early experiments indicate that both kicks are feasible.

Demonstration

During demonstration, our players will perform projection kicks (while the ball is in motion) and high kicks (with the ball being still on the floor).