Humanoid Soccer - A challenge for AI and robotics

Abstract
To foster research in artificial intelligence and robotics, the RoboCup Federation holds annual competitions for soccer robots. The long-term goal is to develop by the year 2050 a team of fully autonomous humanoid robots that can win against the human world soccer champion team. Since 2002, robots with a human-like body plan compete in the Humanoid League.

In the few years the league's existence, the performance of the humanoid soccer robots improved significantly. Now, the robots of the best teams manage basic skills like walking, kicking, and getting-up sufficiently well, show soccer skills, like dribbling, passing, and obstacle avoidance, and play together as a team.

In my talk, I will present our humanoid soccer team NimbRo, the winner of the KidSize soccer tournaments in 2007 and 2008. I will cover mechanical construction, electronics, perception, hierarchical reactive control, and learning.

I will also address some challenges that need to be tackled on the way to the 2050 goal.

Curriculum Vitae

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Sven Behnke received his MS degree in Computer Science (Dipl.-Inform.) in 1997 from Martin-Luther-Universität Halle-Wittenberg. In 2002, he obtained a PhD in Computer Science (Dr. rer. nat.) from Freie Universität Berlin. He spent the year 2003 as postdoctoral researcher at the International Computer Science Institute, Berkeley, CA. From 2004 to 2008, Professor Behnke headed the Humanoid Robots Group at Albert-Ludwigs-Universität Freiburg.
Since April 2008, he is full professor for Autonomous Intelligent Systems at the University of Bonn. His research interests include biologically inspired information processing, humanoid robots, computer vision, speech processing, and machine learning.