

# Using Handheld Computers to Control Humanoid

Sven Behnke, Jürgen Müller and Michael Schreiber

University of Freiburg, Department of Computer Science

Georges-Köhler-Allee 52, 79110 Freiburg, Germany  
{behnke, jmuller, schreibe}@informatik.uni-freiburg.de

## Abstract

*Small humanoid robots available today often lack computing power and vision sensors. They frequently consist only of servos and microcontroller boards. We propose to use off-the-shelf handheld computers, Pocket PCs and ultra-portable PCs, to make them autonomous. These computers are lightweight, compact, robust, affordable, and have many interfaces. It is not too hard to attach them to an existing robot, to interface them to the microcontrollers, and to add a camera to them. The handheld computers have ample computing power to run image processing, self-localization, behavior control, and communication onboard a robot. We used the proposed approach to augment the robots RoboSapien, KHR-1 and Toni. The paper reports experiences made with these autonomous humanoid robots in the RoboCup soccer domain.*