

1. Record Nr.	UNINA9910484271503321
Titolo	RoboCup 2004: Robot Soccer World Cup VIII // edited by Daniele Nardi, Martin Riedmiller, Claude Sammut, José Santos-Victor
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2005
Edizione	[1st ed. 2005.]
Descrizione fisica	1 online resource (XVIII, 678 p.)
Collana	Lecture Notes in Artificial Intelligence, , 2945-9141 ; ; 3276
Altri autori (Persone)	NardiDaniele <1958->
Disciplina	629.8932
Soggetti	Artificial intelligence Computer networks Software engineering User interfaces (Computer systems) Human-computer interaction Computer vision Control engineering Robotics Automation Artificial Intelligence Computer Communication Networks Software Engineering User Interfaces and Human Computer Interaction Computer Vision Control, Robotics, Automation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	RoboCup 2004 symposium was held at the Instituto Superior Tecnico, Lisbon, Portugal, in June and July 2004, in conjunction with the RoboCup competition.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	RoboCup 2004 Overview -- RoboCup 2004 Overview -- Award Winner Papers -- Map-Based Multiple Model Tracking of a Moving Object -- UCHILSIM: A Dynamically and Visually Realistic Simulator for the RoboCup Four Legged League -- Full Papers -- CommLang: Communication for Coachable Agents -- Turning Segways into Robust

Human-Scale Dynamically Balanced Soccer Robots -- A Constructive Feature Detection Approach for Robotic Vision -- Illumination Insensitive Robot Self-Localization Using Panoramic Eigenspaces -- A New Omnidirectional Vision Sensor for Monte-Carlo Localization -- Fuzzy Self-Localization Using Natural Features in the Four-Legged League -- A Behavior Architecture for Autonomous Mobile Robots Based on Potential Fields -- An Egocentric Qualitative Spatial Knowledge Representation Based on Ordering Information for Physical Robot Navigation -- Sensor-Actuator-Comparison as a Basis for Collision Detection for a Quadruped Robot -- Learning to Drive and Simulate Autonomous Mobile Robots -- RoboCupJunior— Four Years Later -- Evolution of Computer Vision Subsystems in Robot Navigation and Image Classification Tasks -- Towards Illumination Invariance in the Legged League -- Using Layered Color Precision for a Self-Calibrating Vision System -- Getting the Most from Your Color Camera in a Color-Coded World -- Combining Exploration and Ad-Hoc Networking in RoboCup Rescue -- Robust Multi-robot Object Localization Using Fuzzy Logic -- Visual Robot Detection in RoboCup Using Neural Networks -- Extensions to Object Recognition in the Four-Legged League -- Predicting Opponent Actions by Observation -- A Model-Based Approach to Robot Joint Control -- Evolutionary Gait-Optimization Using a Fitness Function Based on Proprioception -- Optic Flow Based Skill Learning for a Humanoid to Trap, Approach to, and Pass a Ball -- Learning to Kick the Ball Using Back to Reality -- Cerebellar Augmented Joint Control for a Humanoid Robot -- Dynamically Stable Walking and Kicking Gait Planning for Humanoid Soccer Robots -- An Algorithm That Recognizes and Reproduces Distinct Types of Humanoid Motion Based on Periodically-Constrained Nonlinear PCA -- Three-Dimensional Smooth Trajectory Planning Using Realistic Simulation -- Plug and Play: Fast Automatic Geometry and Color Calibration for Cameras Tracking Robots -- Real-Time Adaptive Colour Segmentation for the RoboCup Middle Size League -- Visual Tracking and Localization of a Small Domestic Robot -- A Vision Based System for Goal-Directed Obstacle Avoidance -- Object Tracking Using Multiple Neuromorphic Vision Sensors -- Interpolation Methods for Global Vision Systems -- A Method of Pseudo Stereo Vision from Images of Cameras Shutter Timing Adjusted -- Automatic Distance Measurement and Material Characterization with Infrared Sensors -- Posters -- A Novel Search Strategy for Autonomous Search and Rescue Robots -- World Modeling in Disaster Environments with Constructive Self-Organizing Maps for Autonomous Search and Rescue Robots -- Approaching Urban Disaster Reality: The ResQ Firesimulator -- Stochastic Map Merging in Rescue Environments -- Orpheus – Universal Reconnaissance Teleoperated Robot -- Navigation Controllability of a Mobile Robot Population -- Sharing Belief in Teams of Heterogeneous Robots -- Formulation and Implementation of Relational Behaviours for Multi-robot Cooperative Systems -- Cooperative Planning and Plan Execution in Partially Observable Dynamic Domains -- Exploring Auction Mechanisms for Role Assignment in Teams of Autonomous Robots -- A Descriptive Language for Flexible and Robust Object Recognition -- Modular Learning System and Scheduling for Behavior Acquisition in Multi-agent Environment -- Realtime Object Recognition Using Decision Tree Learning -- Optimizing Precision of Self-Localization in the Simulated Robotics Soccer -- Path Optimisation Considering Dynamic Constraints -- Analysis by Synthesis, a Novel Method in Mobile Robot Self-Localization -- Robots from Nowhere -- Design and Implementation of Live Commentary System in SoccerSimulation Environment -- Towards a League-Independent

Qualitative Soccer Theory for RoboCup -- Motion Detection and Tracking for an AIBO Robot Using Camera Motion Compensation and Kalman Filtering -- The Use of Gyroscope Feedback in the Control of the Walking Gaits for a Small Humanoid Robot -- The UT Austin Villa 2003 Champion Simulator Coach: A Machine Learning Approach -- ITAS and the Reverse RoboCup Challenge -- SPQR-RDK: A Modular Framework for Programming Mobile Robots -- Mobile Autonomous Robots Play Soccer -- An Intercultural Comparison of Different Approaches Due to Different Prerequisites -- From Games to Applications: Component Reuse in Rescue Robots.

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## Sommario/riassunto

These are the proceedings of the RoboCup 2004 Symposium, held at the Instituto Superior Técnico, in Lisbon, Portugal in conjunction with the RoboCup competition. The papers presented here document the many innovations in robotics that result from RoboCup. A problem in any branch of science or engineering is how to devise tests that can provide objective comparisons between alternative methods. In recent years, competitive engineering challenges have been established to motivate researchers to tackle difficult problems while providing a framework for the comparison of results. RoboCup was one of the first such competitions and has been a model for the organization of challenges following sound scientific principles. In addition to the competition, the associated symposium provides a forum for researchers to present refereed papers. But, for RoboCup, the symposium has the greater goal of encouraging the exchange of ideas between teams so that the competition, as a whole, progresses from year to year and strengthens its contribution to robotics. One hundred and eighteen papers were submitted to the Symposium. Each paper was reviewed by at least two international referees; 30 papers were accepted for presentation at the Symposium as full papers and a further 38 were accepted for poster presentation. The quality of the Symposium could not be maintained without the support of the authors and the generous assistance of the referees.

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