

Cooperative Robots

Organizers & Chairs: Kazuhiro Kosuge, Daniela Rus

Distributed Manipulation of Multiple Objects using Ropes

B. R. Donald, L. Garipey and D. Rus
Dartmouth College

- Algorithms for manipulating multiple (unknown) objects using ropes
- Details of binding, ratcheting, and flossing algorithms
- Analysis of binding algorithm
- Experimental procedures with three robots and results



Distributed Robot Helpers Handling a Single Object in Cooperation with a Human

Y. Hirata and K. Kosuge
Tohoku University

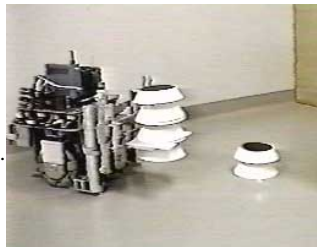
- Human-Robots Cooperation
- Distributed Mobile Robot Helpers
- Mobile Robot is Controlled as if it has a Caster-like Mechanism
- Human Transport a Refrigerator in Cooperation with Multiple Robots



Knowledge Sharing and Cooperation of Autonomous Robots by Intelligent Data Carrier System

D. Kurabayashi and H. Asama
The Institute of Physical and Chemical Research (RIKEN)

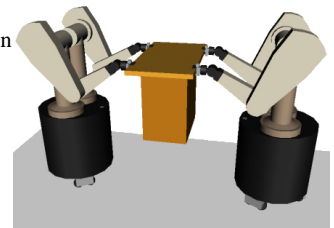
- Effective execution of tasks by autonomous robots without map.
- An algorithm to acquire and share knowledge autonomously.
- Verification by simulations and experiments.



The Augmented Object Model: Cooperative Manipulation and Parallel Mechanism Dynamics

Kyong-Sok Chang, Robert Holmberg and Oussama Khatib
Stanford University

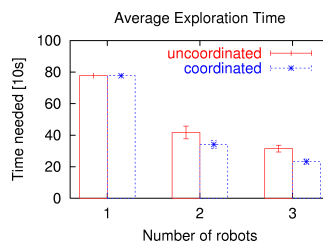
- Branching Mechanisms
- Operational Space Closed-chain Dynamics
- Closed-chain Task/Posture Behavior Control
- Application: Powered-Caster Vehicle



Collaborative Multi-Robot Exploration

W. Burgard¹, M. Moors², D. Fox³, R. Simmons³ and S. Thrun³
¹Universitt Freiburg, ²University of Bonn and ³Carnegie Mellon University

- Teams of mobile robots need to be coordinated whenever they explore or map unknown environments.
- Our approach coordinates the robots by trading off the utility of target locations and the costs of moving there.
- The approach has been implemented and evaluated on real robots and in simulation runs.
- The coordination yields a significant speed-up compared to previous approaches.



Experiments on Capturing a Floating Object by Two Flexible Manipulators

M. Yamano, A. Konno and M. Uchiyama
Tohoku University

- hybrid position/force control of two manipulators
- vibration suppression of flexible links
- procedure of capturing a floating object in 3D space
- experiments using 7-DOF flexible manipulators

