

Human Robot Cooperation

Chairs: Gordon Cheng, Katsushi Ikeuchi

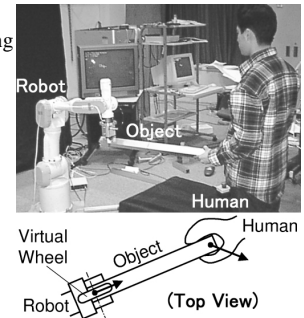
A Robotic Co-operation System based on a Self-organization approached Human Work Model - Assembling Work Support by Vision information and Physical Interaction-
Yasuhiro Hayakawa, Tetsuya Ogata and Shigeki Sugano
Waseda University

- Robot's Support by Understanding Human Behavior
- Construction of Work Process Model by Observing Human Behavior
- Robotic Support System based on the Work Process Model
- Highly Friendly Cooperation without Sacrificing Performance



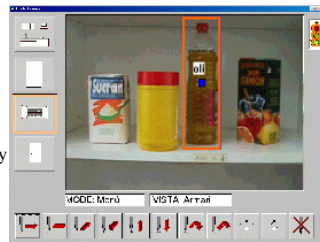
Human-Robot Cooperative Manipulation Using a Virtual Nonholonomic Constraint
Hirohiko Arai¹, Tomohito Takubo², Yasuo Hayashibara³ and Kazuo Tanie¹
¹Mechanical Engineering Laboratory, ²University of Tsukuba and ³Toin University of Yokohama

- Robotic assistance for planar handling of a long object
- Virtual nonholonomic constraint equivalent to a wheel-barrow
- No sideslip and controllability to any position/orientation
- Simple and intuitive maneuver for the human operator



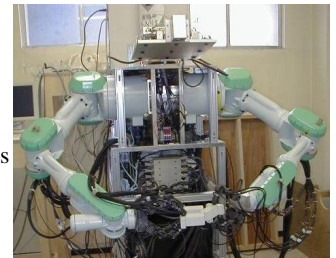
Friendly Interface for Objects Selection in a Robotized Kitchen
A. Casals¹, X. Cufi², J. Freixenet², J. Martí² and X. Muñoz²
¹Polytechnical University of Catalonia and ²Universitat de Girona

- CAPDI: A modular adapted kitchen for the disabled and elder
- A vision based friendly interface is necessary to control a robotic arm and other adapted elements
- Computer vision supports two different compatible and complementary methods for object selection
- The interface is a menu driven screen, having as input device a 4 keys keyboard



Symbolic Generation of Trajectories for Skill Generation
H. Tominaga¹, J. Takamatsu¹, H. Kimura² and K. Ikeuchi¹
¹The University of Tokyo and ²University of Electro-Communications

- Manipulation skill
- Analyzing contact relation
- Decomposition of dimensions
- Designing sub-skills



Infant Behavior Recognition System Based on Pressure Distribution Image

T. Harada, A. Saito, T. Sato and T. Mori
The University of Tokyo

- There is increasing concern about an infant care system recently.
- We developed a novel infant behavior recognition system based on a pressure distribution image.
- Infants' status, posture and body parts positions can be recognized.
- Our system can be useful for care systems such as an automatic growth recoding system or a SIDS prevention system.



Living infant's posture *Recognized posture*

The RoboCup-Rescue Project: A Robotic Approach to the Disaster Mitigation Problem

S. Tadokoro¹, H. Kitano², T. Takahashi³, I. Noda⁴, H. Matsubara⁴, A. Shinjoh⁵, T. Koto⁶, I. Takeuchi⁶, H. Takahashi⁷, F. Matsuno⁸, M. Hatayama⁸, J. Nobe⁹ and S. Shimada¹⁰
¹Kobe University, ²ERATO Kitano Symbiotic Project, ³Chubu University, ⁴Electrotechnical Laboratory, ⁵International Academy of Media Arts and Sciences, ⁶University of Electro Communication, ⁷Port and Harbor Research Institute, ⁸Tokyo Institute of Technology, ⁹Mitsubishi Research Institute and ¹⁰Chukyo University

- Robotics & AI contribution to emergency disaster response problem
- 4 projects: simulation, robotics & infrastructure, integration, and operation
- Strategic agent planning, and integration of virtual world and reality
- Grand challenge for international cooperative research

