Grasping and Manipulation
Chairs: Nikos Papanikolopoulos, K. Yokoi

Intelligent Soft Contact Surface Technology with MEMS in Robotic and Human Augmented Systems

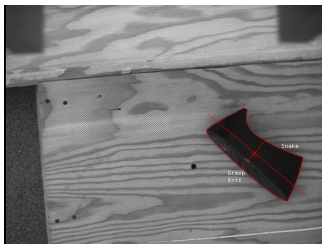
Geng Wang and Imin Kao
SUNY Stony Brook

- Introduce Smart Anthropomorphic Contact Surface Technology (SACST)
- SACST with MEMS in Robotics and Human Augmented Systems
- Application of Robotics Research Results of Soft Contact and Pressure to SACST
- Ongoing Research Results and Conclusions

Unknown Object Grasping Using Statistical Pressure Models

Doug Perrin[1], Christopher E. Smith[2], Osama Masoud[1] and Nikolaos Papanikolopoulos[1]
[1]University of Minnesota and [2]University of Colorado

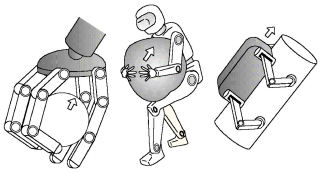
- Grasping of objects
- Region growing snakes to find object contours and simple heuristics to compute grasp pose.
- Grasps of a variety of planar projection objects are shown.
- Region growing dynamic contours have matured to the point where they are useful for real-time vision and control.



A Sufficient Condition for Manipulation of Envelope Family

Makoto Kaneko, Kensuke Harada and Toshio Tsuji
Hiroshima University

- Motivation: Manipulation of an object (or body) in envelope style.
- Approach: Combination of position and torque controlled chains.
- Problem: Given a desired motion, obtain a set of joint torque.
- Result : A sufficient condition for moving an object along chains.



Envelope family

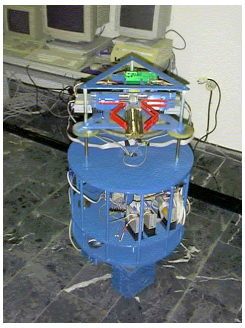
A New Approach to Motion Planning for Disc-Shaped Robots Manipulating a Polygonal Object in the Plane

A. Sudsang and J. Ponce
University of Illinois

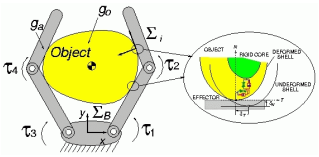
Event-Driven Parts Moving in 2D Endogeneous Environments

C. S. Karagoz[1], H. I. Bozma[1] and D. E. Koditschek[2]
[1]Bogazici University and [2]University of Michigan

- Problem Statement
- Proposed Approach
- Experimental Results
- Conclusion



Dynamic Simulation for Grasping and Whole Arm Manipulation

P. Song, M. Yashima and V. Kumar
University of Pennsylvania

- Difficulties in dynamic simulations of frictional grasps.
- Discussion of different contact models.
- Proposed an integrated simulation approach that combines LCP model and compliant contact model.
- Simulation results of whole arm grasps.