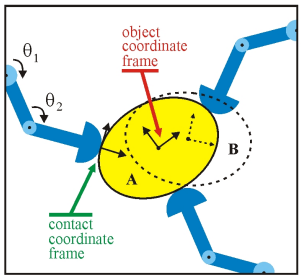
Dexterous Manipulation
Organizers & Chairs: Mark Cutkosky, Martin Buss

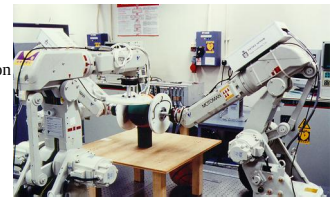
An Overview of Dextrous Manipulation
A. M. Okamura, N. Smaby and M. R. Cutkosky
Stanford University

- Definition of dexterous manipulation
- Formulation of the dexterous manipulation problem using kinematics, contact types, and forces
- Grasp planning/quality measures and mid- and low-level control frameworks
- List of accomplishments and areas for future work



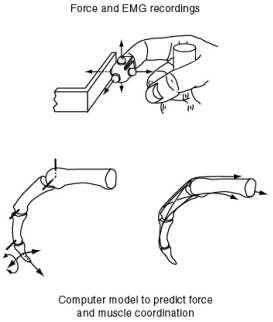
The Planning and Control of Robot Dextrous Manipultation
Li Han[1], Zexiang Li[2], Jeff Trinkle[3], Zhiqiang Qin[2] and Shilong Jiang[2]
[1]Texas A&M University, [2]Hong Kong University of Science and Technology and [3]Sandia National Laboratory

- Problem Statement for Robot Dextrous Manipulation
- Force and Motion Feasibility/Optimization Issues
- Modular Manipulation Planning and Control Strategy
- Experimental Results



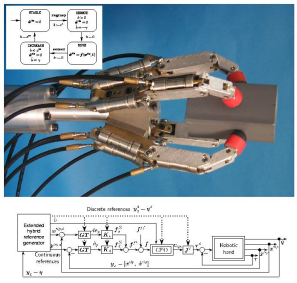
Applying principles of robotics to understand the biomechanics, neuromuscular control and clinical rehabilitation of human digits
F. J. Valero-Cuevas
Cornell University

- The function and control of the hand are not well understood
- Principles of robotics reveal the mechanics of the hand
- Computer models help design surgical procedures
- Experiments and models reveal the neural control of dexterity



A Discrete-Continuous Control Approach to Dextrous Manipulation
Martin Buss and Thomas Schlegl
Technische Universitat Muenchen

- Introduction & Motivation
- Hybrid Modeling & Control Architecture
- Regrasping Experimental Results
- Conclusions & Future Work



Rolling Contacts and Dextrous Manipulation
A. Bicchi and A. Marigo
University of Pisa

- Nonholonomy on purpose: manipulation by rolling
- Theoretical foundations: classification of admissible contacts
- Proof of the long-standing conjecture on generic controllability of rolling
- Conclusions and open problems