

Applications of Grasping

Chairs: Zexiang Li, Kimon Valavanis

Flexible Object Manipulation by Dual Manipulator System

T. Fukuda, T. Matsuno and F. Arai
Nagoya University

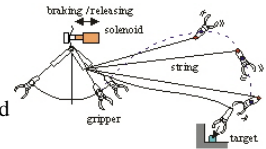
- Dual 6 D.O.F direct drive manipulator
- The manipulator ties the rope around a cylinder
- The manipulator confirms having a rope in both hands by the force sensor
- A flexible object model and a vision system are used to recognize the shape of the rope



Casting Manipulation (Braking Control for Catching Motion)

H. Arisumi, K. Yokoi and K. Komoriya
Mechanical Engineering Laboratory (MEL)

- A manipulator system with a string for catching inaccessible object
- The motion of the gripper is controlled by applying force to the gripper
- The gripper can catch the object by control of the string movement
- The desired motion of the gripper can be realized by braking control

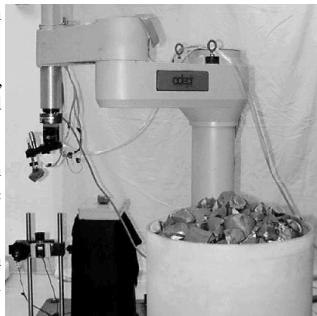


The Design and Implementation of a Robot Assisted Crucible Charging System

V. A. Sujan¹, S. Dubowsky¹ and Y. Ohkami²

¹Massachusetts Institute of Technology and ²Tokyo Institute of Technology

- Manual packing of silicon nuggets in CZ wafer production is not practical
- Robotic system consisting of gripper, vision, packing algorithm and hybrid control developed
- 36 inch diameter crucibles packed in about 4 1/2 hours with the robotic system
- The integrated system achieves high production rates, required precision and cost effectiveness



Grasp Force Control in Two-Finger Grippers with Pneumatic Actuation

Erika Ottaviano, Maria Toti and Marco Ceccarelli
Universit degli Studi di Cassino

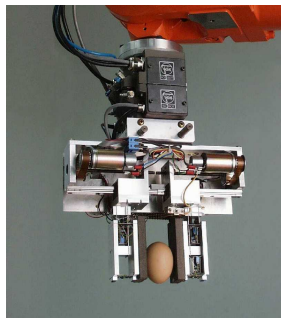
- The aim of the paper is to design a force control for two-finger gripper with pneumatic actuation by using standard components in order to maintain the simplicity of the mechanical design and operation of the gripper with a low-cost layout.
- The control system based on PI scheme makes the gripper capable to maintain the grasp with a prescribed force in presence of significant movements of the gripper or impulsive external forces.
- Experimental tests have been carried out at the Laboratory of Robotics and Mechatronics in Cassino.
- Practical feasibility of two-finger grippers with force controlled pneumatic actuation is proved.



Sensory Gripping System for Variable Products

W. Friedrich, H. Nicholls and P. Lim
Industrial Research Ltd.

- Handling of delicate objects
- Gripper design philosophy
- Grasp establishment
- Experimental results



Design and Analysis of a Reconfigurable Robotic Gripper for Limp Material Handling

R. Kolluru, K. P. Valavanis, S. A. Smith and N. Tsourveloudis
University of Southwestern Louisiana