

ABSTRACT
Ph.D THESIS

**PRESHAPING CONTROL FOR DEXTEROUS MANIPULATION
WITH A MULTIFINGERED ROBOT HAND**

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In a dextrous manipulation, one of the major problems that remains to be solved is the determination of an appropriate preshape for grasping a given object, under a manipulation task. In order to have a successful grasp execution, the system should have a successful grasp preparation at the preshaping phase. Grasp Performance Measure analyses are important for grasping with a robot hand as well as for the preshape.

In our work, we design and implement an “Intelligent Control System” for precision grasping beginning from hand preshaping, synthesizing from object properties, manipulation task characteristics, kinematic analysis and evaluation of contact wrench patterns via approximate reasoning with learning abilities, which is finally demonstrated in an antropomorphic robot hand simulation.

Keywords: Dextrous Manipulation, Robot Hand, Grasp Synthesis, Grasp Preshaping, Preshaping Controller.