Grasp Planning Based on Strategy Extracted from Demonstration

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Motivation and Approach

• Generate a good grasp
  – Enable robots to perform a task
  – Maintain grasp during the task
• One approach
  – Learn grasp from human demonstration
  – Map the learning result to robotic hands
• Challenge
  – Don’t have the same mechanical structure
  – Difficult to transfer learning results
• Our Solution
  – Extract general strategy independent of the mechanical structure
• Strategies
  – Grasp type
  – Thumb placement
• Apply to robotic hands
  – Find other finger’s placements to optimize a grasp quality measure

Opposable Thumb
Reduce Search Space

Thumb Placement
Thumb yaw angle
Thumb pitch angle
Thumb joint angle

Wrist position and orientation

6-DOF

2-DOF

The Workspace of Wrist
Thumb Fingertip

The Workspace of Wrist

Wrist

Object
Thumb Fingertip
Indicating Different Tasks
References