

'Pass Me the Cup!'

Object Passing Service with Stable Pushing Planner

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Interaction of Human-Care Service Robots

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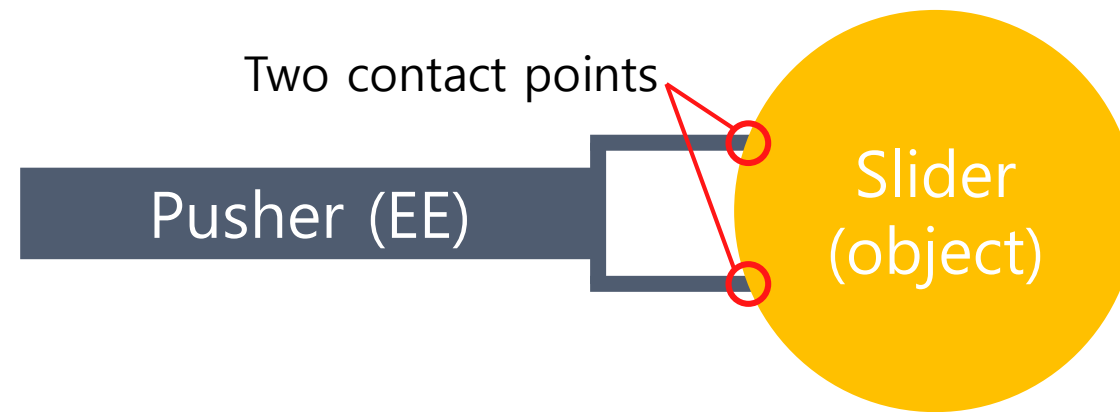
Introduction

- Limits of prehensile manipulation
 - Grasping objects without delicate control might lead to breaking of the object
 - Maintaining orientation of the object gives constraints to the joints

- Advantages of non-prehensile manipulation
 - As long as the end-effector can stick to the object, the manipulation is stable
 - The z-axis orientation of the object can be maintained at all times

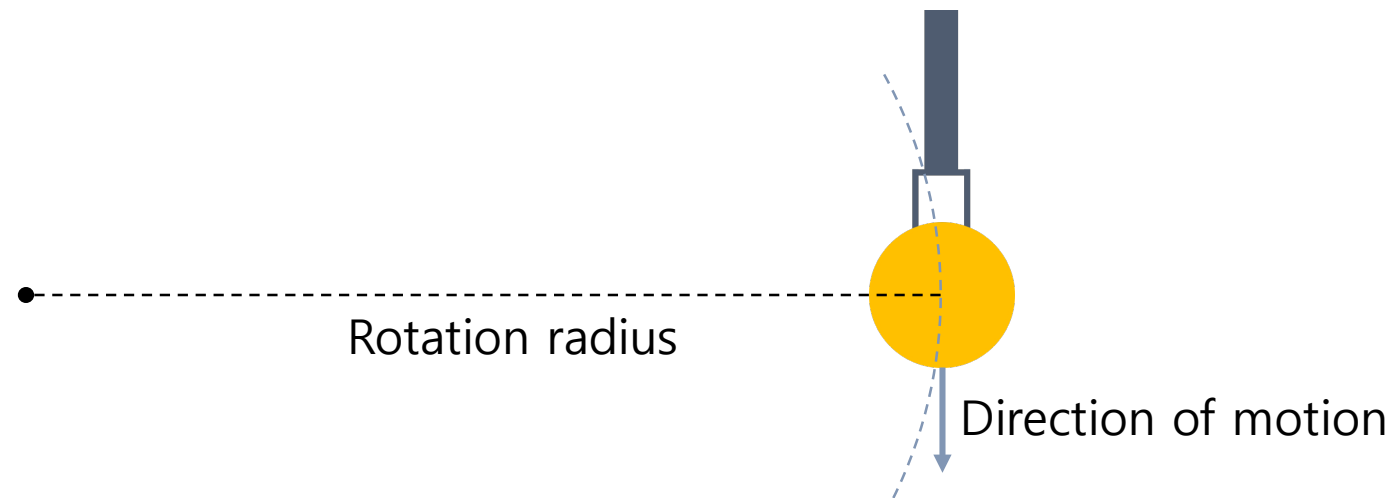
Pusher-Slider System

- Explanation of terminology



Pusher-Slider System

- Friction modeling with Newton's law of friction
 - Finding the minimum stable rotation radius of the system
 - Focus on the friction between the floor and the slider



Results

- Required rotation < 45 degrees



- 45 degrees $<$ Required rotation < 90 degrees



Thank You!