

**Problem 1:** (10 points) Problem 1 in Chapter 5 of the MLS text.

- For part (a), construct the grasp map and determine force closure.
- For parts (b,c), you only need determine if the grasps are force closure

**Problem 2:** (10 points) Problem 2(a) in Chapter 5 of the MLS text.

**Problem 3:** (5 points) Problem 3(b) in Chapter 5 of the MLS text. You need only determine if the grasp is force closure (if constructing the grasp map helps you, then by all means construct the grasp map. But it is not necessary).

**Problem 4:** (10 points) Problem 4(b) in Chapt. 5 of MLS.

**Problem 5:** (10 points) Problem 8(c) in Chapt. 5 of MLS.

**Problem 6:** (10 points) For the grasp pictured below, assume a point contact with friction model, where  $\mu = \tan 30^\circ$ .

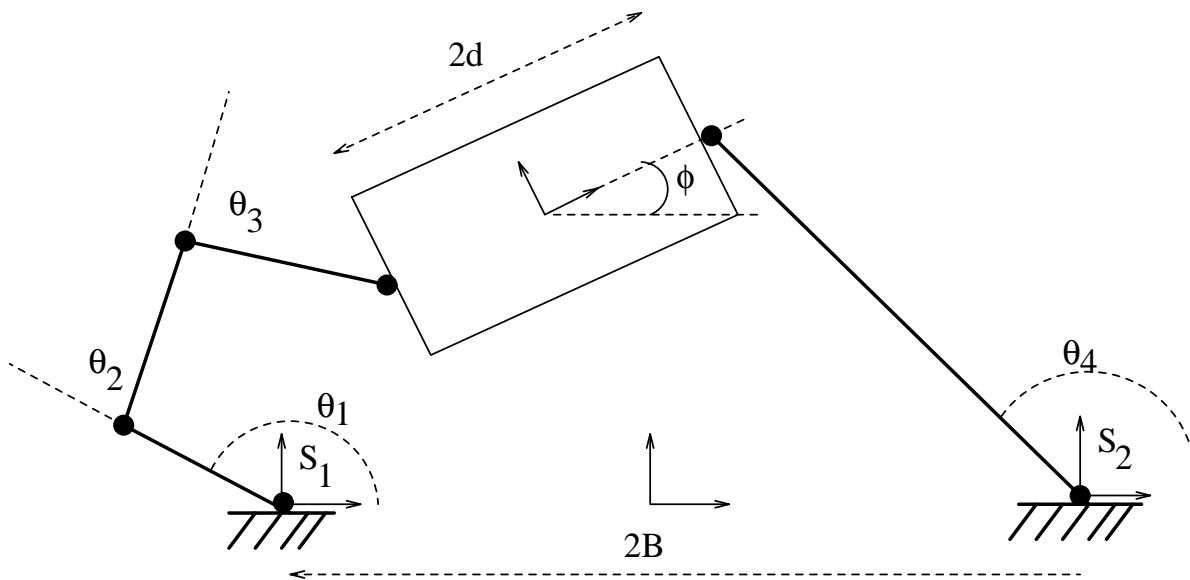


Figure 1: Two Fingred Grasp

1. Is this grasp Force Closure?
2. Calculate the grasp constraint equations. Is this grasp manipulable?