

5.6 Consider a robot manipulator as shown in Figure P5.6. The kinematic structure of this robotic arm is very similar to that of the Stanford manipulator studied in example 5.6 except that it has an offset (a) between the base and the shoulder (the first two) joint axes. For this robotic arm, derive and solve the kinematic position equations using shape and joint matrices.

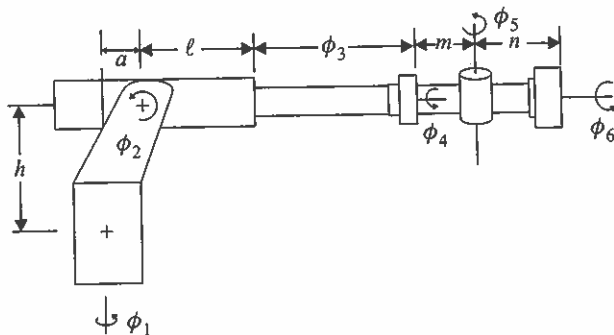


Figure P5.6

5.7 For the robot manipulator of problem 5.6, derive the kinematic position equations using Denavit-Hartenberg transformation matrices and find the solution to these equations using the partitioning method of section 5.7.