

ME729 Advanced Robotics - Project #2 description

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❑ Objectives

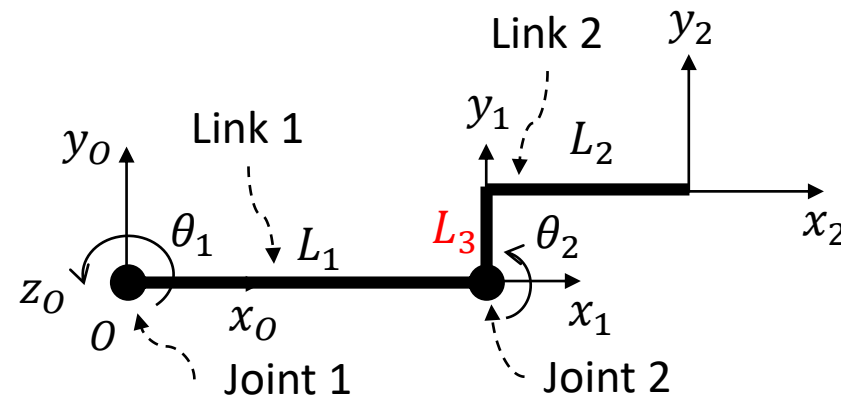
- The purpose of this project is to understand the flow of robotics: DH table, forward kinematics, and inverse kinematics with the modified two-link planar manipulator which has an offset at joint two.

❑ Presentation

- Present all of your tasks with a code explanation, and show your demo.
- **Submit your presentation file before start the class, i.e. before 4/2/18 6 p.m.**

❑ Tasks

- Math problems: consider the modified two-link planar manipulator (see a following figure). **A Link offset L_3 is added.**



- 1) Make a DH parameter table.
- 2) Find the position of the manipulator tip.
- 3) Choose which methods do you use for inverse kinematics: **Algebraic method or Jacobi method.**
- 4) According to your choice, derive the required equations.

☐ Tasks - continued

- Programming problems: based on your project #1
 - 1) Make your own subroutine to find a solution of kinematic equations.
 - $L_1 : 21 \text{ studs} * 8 \text{ mm} = \mathbf{168 \text{ mm}}$
 - $L_2 : 4 \text{ studs} * 8 \text{ mm} = \mathbf{32 \text{ mm}}$.
 - $L_3 : 4 \text{ studs} * 8 \text{ mm} = \mathbf{32 \text{ mm}}$.
 - 2) In Figure 1. there are four points: (-120 mm, 120 mm), (-72 mm, 136 mm), (56 mm, 136 mm), and (160 mm, 96 mm). As Figure 2., whenever a right or a left arrow button is pressed, let the manipulator's tip place at each point. That is, when the first right press, it places at point 1. Next when the second press, at point 2. But if the left press, it places again at point 1.
- Note that the modified two-link manipulator is different from the before model. So you CAN NOT use any equations of the previous model.

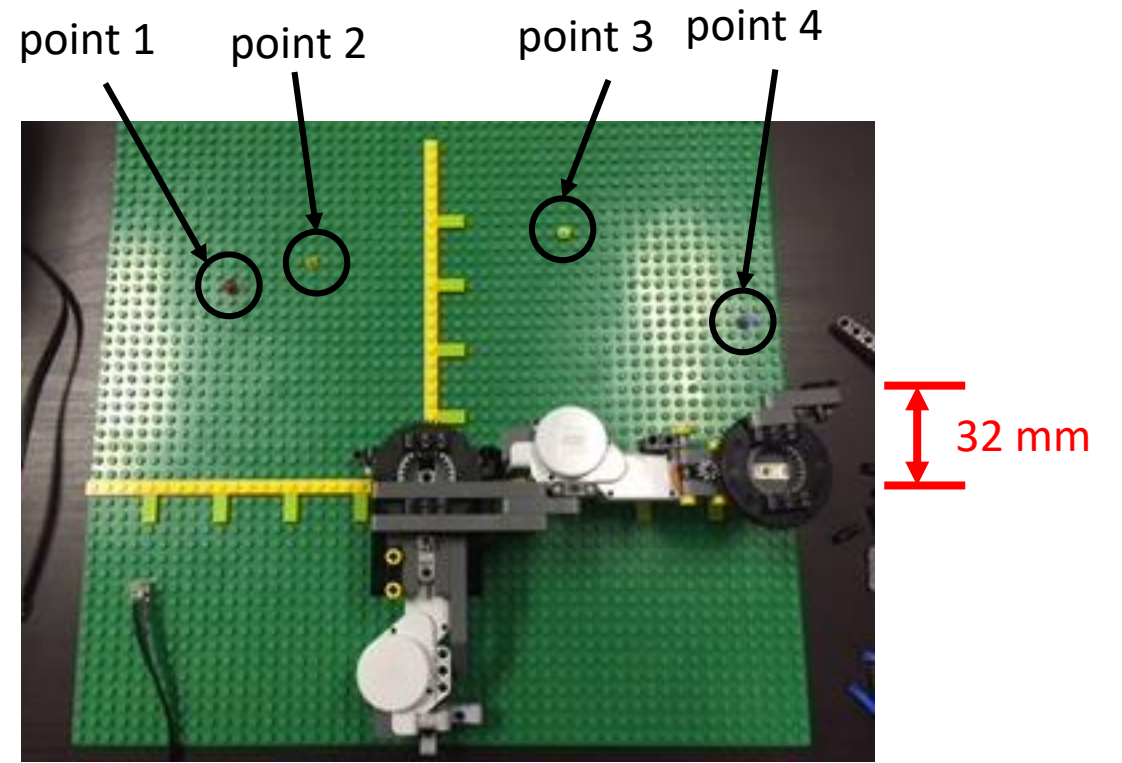
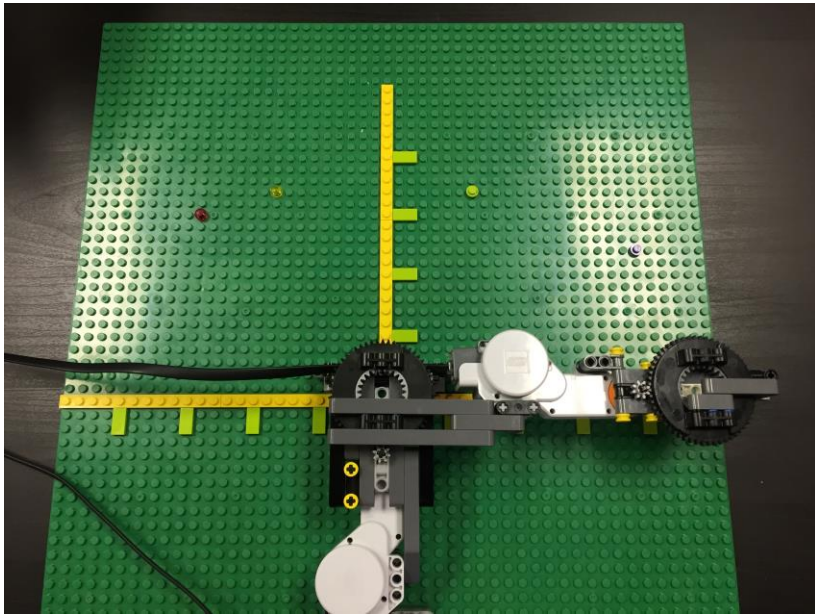


Figure 1.

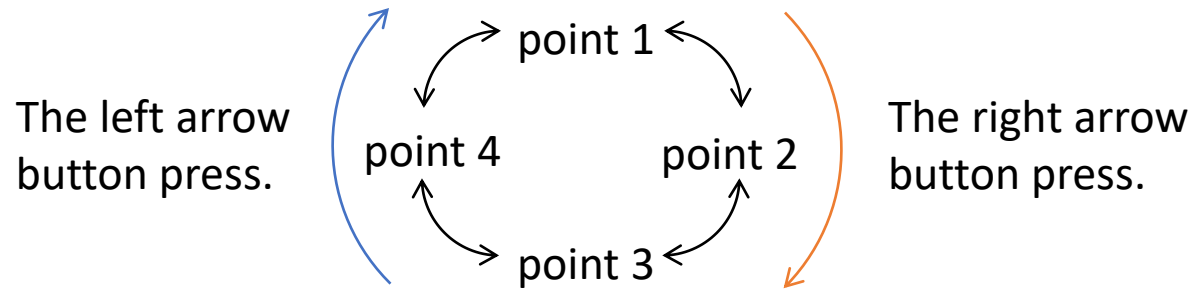


Figure 2.