

Assignment 3.3

Exploring Architectural Robotics

Posted April 7
Due before next class

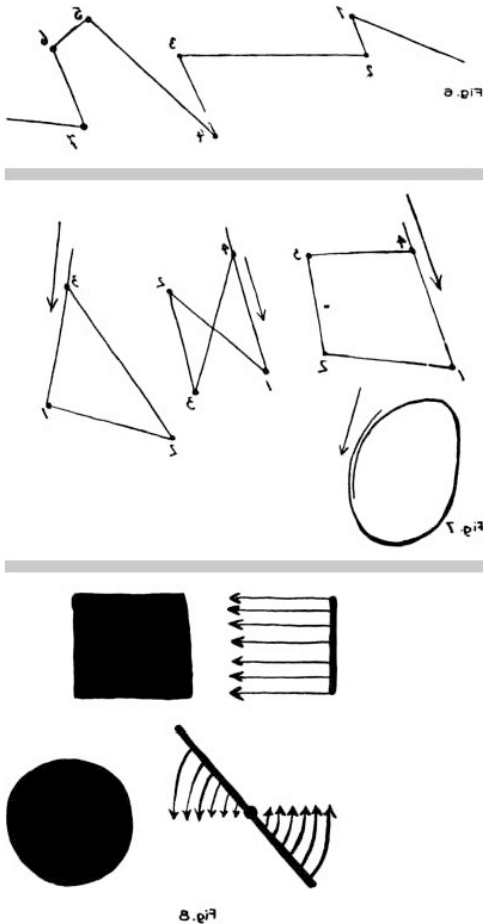


Figure 1. Klee's key "Pedagogical Sketchbook" offers a definition geometric languages based in motion.

kinds of robotic tools to perform creative tasks. Individually or with a partner, design and prototype a tool to attach to our ABB robot's end-effector, that takes advantage of its programmability. Depending on the kind of tool you will develop, you will have to learn about the Robot's attachment's plate. Make sure you model your tool precisely in 3-D, and learn to incorporate it into RobotStudio's library. Bring your tool prototype to the class, and document in the blog your intent through a) sketches, b) a 3-D model, c) photos and d) a simple simulation in RobotStudio.

Overview

This assignment asks you to get comfortable with robotic workflows, and to start imagining creative ways of using the robot in design.

Part 1: Robotic Light Drawings

Using what you learned in class about Rapid and RobotStudio, and the LED device you saw in the lab today, create rapid code for the robot to make a light drawing in three-dimensional space. Your goal is a series of long-exposure shots of the robot drawing in 3-D space.

You can use Rapid code directly, or use the RobotStudio interface. Remember the steps: once you have written the Rapid code, you must simulate the execution of the code in RobotStudio. Once you are satisfied with the simulation and the drawing, set a time with the robot to execute your code (for this, you will need to arrange a time with Jamie Heilman). You will have to run it first in manual mode first, before running it in automatic mode. You may have to do several tries and change the speed to make sure that you are getting a good long exposure shot. Document the process carefully in the blog, and post the long-exposure photographs of your drawing. If you are feeling adventurous, use your knowledge of Processing to edit the Arduino code driving the LED, in order to play with different values of color and intermittence.

Hint: Think creatively and *computationally* about your drawing. Use the concepts of iteration and modularity to create an interesting *spatial* drawing that takes advantage of the robot's precision and automation.

Part 2: Robotic tool-making

(Individual or in pairs) So, we know that the robot can move and we know that you can program the robot. So what? For this assignment, your goal is to design and build an imaginative robot-tool assembly.

There are infinite possibilities to be explored in terms of defining new