Labs 5 & 6 Mini-Project: Interactive Kinetic Sculpture

Lab professors: Ellen Wetmore, Holly Yanco, Adam Norton

Lab 5 (on 2/24 or 3/1):
Designing the project and construction of the mechanism and 3D structure.

Lab 6 (on 3/3 or 3/8):
Integrating the motors and sensors, programming and troubleshooting.

Due: 3/8 (for Thursday lab students) or 3/10 (for Tuesday lab students) – on the due date, bring your mini-project to the lecture, where you will present it to the full class.

Overview: These two labs form a mini-project in which you will create a 3D interactive kinetic sculpture. For this mini-project, we have introduced different kinds of mechanisms, motors, and sensors in the lectures and labs to date. You need to integrate the materials together to create a moving sculpture that responds to viewers. The sculpture does not have to be representative, but needs to be moving under certain conditions and should have an aesthetic quality - in other words - it should be kinetic, interactive and visually engaging. Consider the gesture your machine makes, or how it interacts with the viewer, or what visual elements the mechanism propels. Know that you will be evaluated on the look of the machinery and the materials you choose to integrate. These should support your concept.

Materials:

- For base mechanism - Plywood, foam core, cardboard, mdf, balsa, wire, wood dowel, rubber bands, screws, bolts and nails.
- For 3D structure - Wood, cardboard, wire, or 1-2 kinds of recycled materials. Use your imagination.

Process:

1. Concept drawing: Design your structure and mechanism to move the structure. Draw your idea in your sketchbook. A photocopy of your drawing needs to be submitted along with the lab write-up.

2. Aesthetic structure: Design and build your sculpture in a portable size between 8 inches to 16 inches in width, height and depth. Consider visual qualities such as weight, line, light, balance or unbalance, mass, texture, light and shadow. Please limit the number of different materials to one or two in order to keep consistency and unity in the sculpture (less is more…). The following picture shows a way of creating 3D structure out of simple materials - paper straws and card stock.
3. Minimal mechanism: To create a moving part in your sculpture, make sure to employ at least one mechanism among those covered in the lecture. You are also required to use a servo motor in your mechanism. (You may also use a DC motor in addition to the servo motor, if you’d like.)

4. Mounting of mechanism and electric parts: Figure out where and how your motors, sensors and mechanism will be mounted in the base. You may need several assisting structures to hold your artwork and the mechanism. Build a secure base structure out of masonite, balsa, thin mdf, or other material. Please limit the use of glue or duck tape if you can, since glued parts are not secure and visually unpleasant many cases. Use good craftsmanship!!

**Minimum Requirements:**

- Used a servo motor (you can also use a DC if you like)
- Used a sensor
- Interactive and kinetic
- Employed at least one mechanism among the following: cams, cranks, gearing, ratchets, linkages or levers.

**Lab write-up (one write up will cover both labs, due at lecture on the day of your presentation):**

1. Your concept drawing - Attach a photocopy of your drawing (or the original if you didn’t draw it in your sketchbook).
2. Design strategy and concept - Describe overall concept in the visual and interactive aspect of the artwork.
3. Mechanical function - Describe what kind of motion was planned and how it was realized. You need to employ at least one mechanism beyond simple rotation from motors.
4. Programming strategy - Describe your plan on using motors and sensors and how the script was designed.
5. Reflection on the audience response
6. Your program code - it also needs to be emailed to Holly (holly@cs.uml.edu).