COMP 3490 – Graphics I

Fall 2017 Semester

Assignment 1: The Claw Machine (Barebones Edition)

DUE: October 15, 2017

In this assignment, you will implement the basic structure of a claw (crane) machine, insert necessary geometry, build a claw mechanism, and add some basic animation. This might not look beautiful, but you will get to dress it up later. The following details what is required, what to hand in, useful resources, the grading scheme, and other tips.

For definitions of some of the items that appear in the requirements , see Figure 1.

Assignment Requirements

[1 mark] Box with supports and a top

[1 mark] Console, joystick, prize bin/chute and guard are present

[1 mark] Arrow keys cause joystick to bend (in a way that looks reasonable)

[2 marks] Claw mechanism created in a hierarchical manner **(See Figure 2)**

[2 mark] Keyboard allows claw to move

[1 mark] Spacebar drops claw

[2 mark] Pressing "v" changes from "generic" view to "egocentric" view **(See Figure 3)**

Total: 10 Marks

Note that for this assignment, your "claw" (the bit that grabs things) can be very simple. Even a sphere. However, you will be making this something more complex in the 2nd assignment.

Skeleton code is provided that you may use in implementing the requirements of the assignment. You are not required to use this skeleton code, but it is recommended. **You should submit your code as an archived file**. (e.g. .zip). Your code should work when the .html file is launched in a browser on a Windows 10 machine. **Name the file lastname_firstname.zip and submit to the A1 dropbox on umlearn.**

You should also **complete the information requested in the included "README.txt"**, which also provides an indication of which components you feel you have completed successfully. **Include this with your submission.**

Tips and Resources

There is an associated js directory included with functionality that has been developed by the open source community over time. You should feel free to make use of functionality that appears in this folder. Some of it already is already used in the skeleton.

Although Assignment 1 includes mostly simple elements, you will benefit from examining examples on the THREE.js site.

The main page includes complex examples, and demos intended to promote commercial products. However the “examples” link in the left bar provides simpler examples of how to do different things.

This is located at: https://threejs.org/examples/

Given that you are dealing mostly with simple elements, you might actually find the docs more useful.

This is located at: https://threejs.org/docs/

There are many other examples and resources online. If you feel utterly lost, please contact me so that I can provide guidance on where to start.

There are many DIY projects for physical claw/crane machines. You can feel free to use these as a guide. As some of these include 3D printed materials, there may also be models you can make use of. Models, and other nuances of the machine will become more important for assignment 2. However, for basic ideas and dimensions, you might benefit from looking at some examples now. A few are listed below, but there are many others on the interwebs.

http://www.instructables.com/id/DIY-CLAW-MACHINE/

http://www.retrobuiltgames.com/the-build-page/arduino-claw-machine/

http://viralcatcher.com/how-to-make-hydraulic-powered-claw-machine-from-cardboard/

http://www.instructables.com/id/Arduino-Claw-Machine/

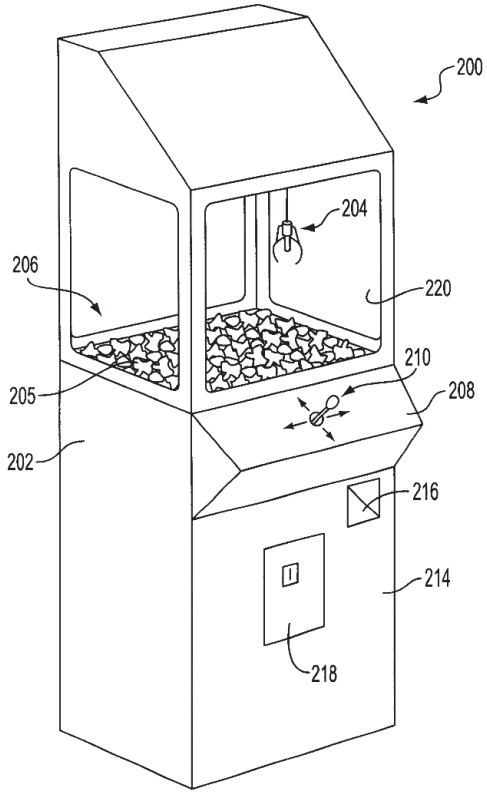
And others. You may also look at examples outside of these or other DIY projects for inspiration.

Also: You don’t need to make a fancy claw yet. But for some inspiration, you might look here:

https://www.youtube.com/watch?v=Um3-F58XmAs

https://static.vecteezy.com/system/resources/previews/000/088/145/non_2x/stylized-claw-machine-claw-set-vector.jpg

Figure 1: From US Patent US6234487 - Crane game claw gauge



200: The machine

204: The claw

220: Wraps around the frame supporting the top

202: Part of the bottom box that holds things up

206: Points to cool stuff inside (prizes)

205: Goes to the base of the inside, where the prizes sit

216: The prize bin/chute. There is a hole in the base of 205 that allows prizes to fall through to the bin/chute. Often there is a slightly raised edge around this hole (the guard) to keep things from accidentally being pushed in.

208: The console

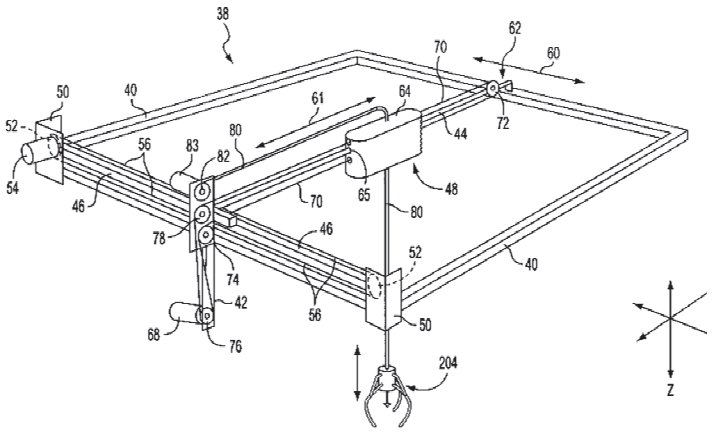
210: The joystick. When you move the joystick, the claw moves.

218: A coin chute. Not necessary for this assignment, unless you want one.

Note that this shows the basic elements of the machine. Variations on the form factor are allowed, as long as the basic elements and functionality are present.

Figure 2: From US Patent US6234487

Claw mechanism. The numbers are hard to see. The essential elements required are:



1: A frame (the square / rectangle)

2: A bar that moves along 1 dimension (orthogonal to z in the diagram, and pointing at the diagram)

3: A unit attached to or within the bar that moves along the bar in a direction parallel to the bar

4: A claw attached by a wire, cord etc. to the unit in 3. The spacebar will drop the claw close to the base of the machine. (205)

Figure 3: Provides a basic sense of the difference between the generic view, and egocentric view. The generic view is a nicely chosen view of the machine in the space where it resides. The egocentric view is what you might see if you were using the machine to play.

(i) One possible "generic view" (From http://amuseaustralia.com/maxi-claw/maxiclaw-machine-the-best-performing-crane-machine-in-the-world/)

(ii) One style of "egocentric view" – Captured from https://www.youtube.com/watch?v=nDb7dWiCv1U

Note that you have some discretion in choosing exactly what these viewpoints should look like, but try to make reasonable choices.