

Final Project

Proposal: 3/30

Final Report and Prototype: 4/26

In this project you will design and build a circuit to measure the water level in a tank. For the tank, you may use a cup. You may employ any kind of sensor, including resistive, optical, magnetic, capacitive, or a floatation device. The point is to be creative and to take advantage of what you have learned in this class.

You are highly encouraged to brainstorm with your lab partner(s) to come up with a good solution. Do not simply search the Internet and copy someone else's design. If you are having trouble, ask your GSI or instructor for help.

You need to write a one-page proposal to your GSI, including a block diagram, and a list of components that you may need in your design. Once your project proposal is approved, you can actually start building the circuit. You may build and test the circuits in the lab or you may borrow a National Instruments myDAQ and work at home.

You have three weeks starting from 4/9 to complete the project (no additional lab assignments will be due). You are encouraged to finish your project as soon as possible and use the last week to fine tune and test your project.

In the final week of the lab, you need to demonstrate the working circuit to your GSI during the lab, and submit final report to your lab GSI.

In the report, include a block diagram of your system, a picture of your setup, a schematic of your circuit, and an explanation of the working principles.

Design Specifications

- For simplicity, you only need to detect three water levels (empty, half, and full). For the water assume distilled water.
- You may only use simple circuit building blocks including resistors (pots, rheostats), capacitors, inductors, LEDs, diodes, op-amps, comparators, analog multiplexer (mux), logic gates, latches, and flip-flops.
- If you would like to use a component not listed above, ask your GSI for approval.
- Circuit should light up one of three LEDs depending on water level. The circuit should settle within a short time (< 1 second).