

Project Title: LED Coffee table  
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EECS 149/249A Project Charter, Fall, 2014

### Overview

This project will create a 2 dimensional LED board that can track and display patterns of hand motions over the board within a certain proximity.

### Approach

The project will model presence of opaque objects over the board through the combination of sensor inputs (photocells, proximity, or other sensors tbd). The sensors will output data to a controller (likely an mbed microcontroller or something similar) that controls which LEDs light up. The goal is to be able to accurately capture motions and display the correct LEDs with minimal error.

### Objectives

To create an array of LEDs to light up only when an object is directly above it.  
Dynamically track said object and retain its state after the object has passed.

### Major Deliverables

- October 21: Project charter (this document)
- October 28: Choice of sensors finalized after discussion with GSIs.
- November 4: Statecharts simulation model with logic. Test devices chosen
- November 11: Installed software for development, more parts testing. construction of board
- November 18: Mini project update: Demonstrate sensor action
- November 25: Measure sensor accuracy and calibrate appropriately
- December 2: Continue debugging. If no bugs, add features
- December 9: System testing, measure false positives, assess sensitivity and calibrate for different test environments

If time, add additional features (ideas in mind: pattern recognition, image file display, etc.)

- December 16: Demonstration video made, powerpoint prepared.
- December 17: Final presentation and demo.
- December 19: Project report and video turned in.

### Risk and Feasibility

There are many unknowns. We're not sure what sensors we're using yet, but different ones have different issues. Photocells are too receptive, proximity can't have a surface above it, etc. Difficulties mapping sensor information to what lights turn on where. Different environment conditions may affect performance.