

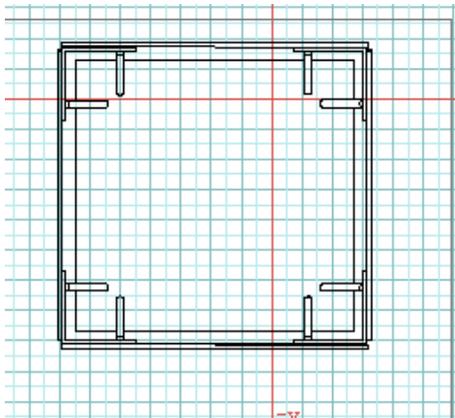
Project: Drift Room

Team Members: Tajin Biswas, Gabe Johnson, Chang Zhang

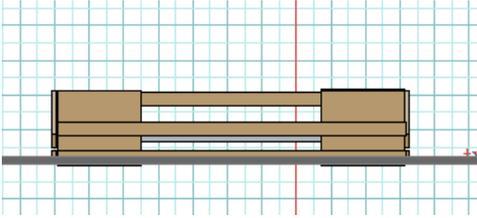
In the spirit of the Royal College of Art's Drift Table, we offer the Drift Room as a playful environment for children to explore their city. Like the prior work, the Drift Room provides a slowly 'drifting' projection an aerial scene, along with pressure sensors that affect change in the image's drift direction. The Drift Room primarily differs from its predecessor in scale: the projection surface is an eight foot square region, on which six adults may comfortably stand. As children play in the Drift Room they can explore local or regional geography, or play with the visual effects of standing or moving. The overhead projector shines its image onto the floor from directly above. The floor is supported by a number of springs, which adds physical reinforcement of the direction of the drift.

Project Assembly Space and Requirements: The project had to fit in an 8'x 8' cube, located on the fourth floor in the Margaret Morrison Building. The project had to be deployable.

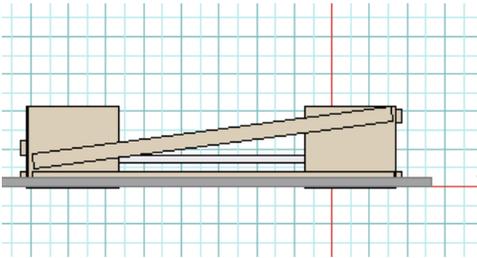
Drawings and Model:



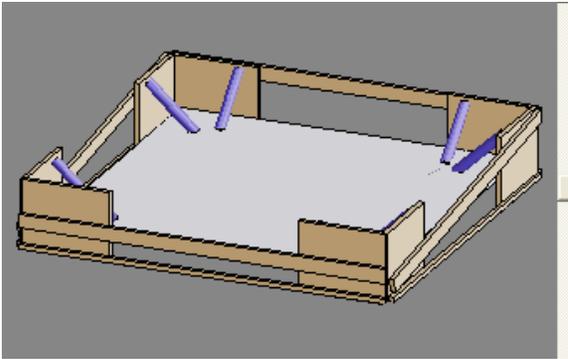
Plan of the spring mounted floor



Elevation of the Framing that suspends the floor



Cross Bracing used to give some stability to the movements



The Floor suspended from the corner of the frame with springs. This reacts to the weight of the people stepping on to the floor.

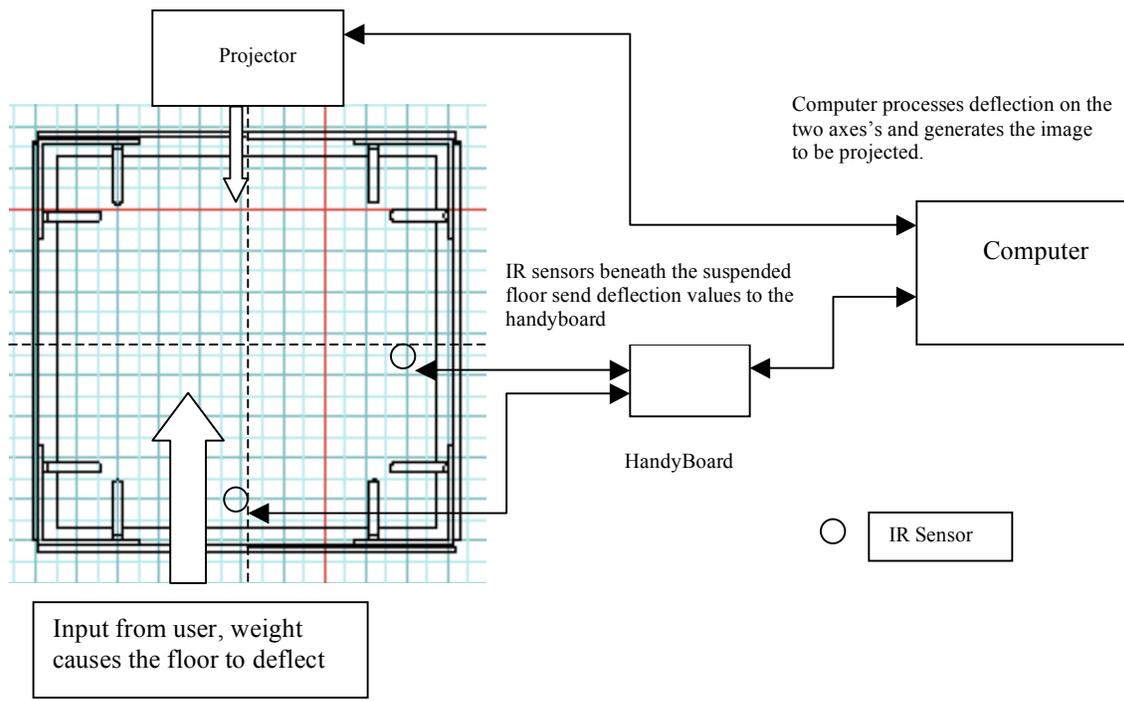


Figure: Flow Diagram between the components

Physical Components:

This project had several physical components. The floor was built with pieces of sip panel joined together to make it a size 7'x6'. The frame to suspend it was built out of 2"x 6" sections of wood. The bracing was made by smaller sections which were cross braced for more stability and strength. There were eight springs two on each corner. The springs were anchored into the floor with eye hooks and hung off the vertical frame with eye hooks.

An adjustable mount for the projector was made so that it could be hung from the ceiling of the 8'x8' cube where the project was deployed.

Electrical Equipments:

Two IR sensors, a handy board, a computer and a projector were the other equipments. The projector is mounted on the ceiling, displays aerial footage of some area of the world onto the floor. The focal point of the image changes as a function of weight (detected by the sensors). Not to mention lots of wiring, extension cord and an extra long VGA cable (see picture at the end).

Software:

The handy board reads data from the IR sensors and writes data to the serial output. For this we used Fred Martin's serialio.c code. A short Python script running on a laptop computer read the data from the serial input and calculated a running average over five seconds. Every five seconds, the Python script writes the current dx,dy heading to a file. This represents the direction the map should drift.

We chose to leverage the Google Maps API for displaying map data. The client portion of Google Maps is implemented in Javascript. One of the security restrictions on unsigned Javascript applications is that it may only communicate with the web server that the script was downloaded from. Javascript also has a security restriction on reading local files. So in order for our Javascript application to gain access to the dx,dy location, it must read it from the web server.

We chose to run an Apache Tomcat web server on the laptop. The drift room web page (and thus the Javascript application) is accessed through this web server. Written in JavaServer Pages (JSP), the web server is able to access the local hard disk and access the dx,dy location.

A simple AJAX script provided the link between the web browser and the web server (both physically hosted on the same laptop, though conceptually separate). We used the AJAX script to fetch the current heading from the web server once every five seconds.

Working on the Project:

Getting suitable materials and testing them out for strength was a major issue. We started a small size mock up which was about one fourth the real size, about 3'x 3'. The springs that were used for this size was not adequate enough so we used more than we had anticipated. Also the corners of the outer frame were not strong enough for withstanding too much loading. We had bracing under the 3/4th inch plywood which came off after a few trials of heavy bouncing.

We had thought of bicycle shock absorbers instead of the springs but found that they were too stiff for the kind of deflection that we were looking for. When building the full scale floor we started with 2"x 2" sections for the basic floor and 3" foam. The foam had to be reinforced with plywood and the frame was also deflecting. Eventually we used

sip panels (4" section) which was strong enough to take the load without self deflection. The outer frame which the floor is suspended from was made out of the 2"x 6" sections at the corners and 2"x 2" sections for the bracing around it. Bolted eye hooks are used in the floor and the vertical sides for the springs.

The idea of having a projection that covered the whole floor was cut short as the projection distance was too small. We had tested that it would require twice the length to project on the whole floor. Placing the projector on the floor and projecting it on to a ceiling mounted mirror was an option that we had not implemented in the end. There is an inherent problem of having the projector project from above-if someone stands right in its path there are shadows and the image is blocked.

Future Developments:

The input from the sensors tells which way the image should drift. If bouncing/jumping could be converted to zooming features then that would be an interesting output.



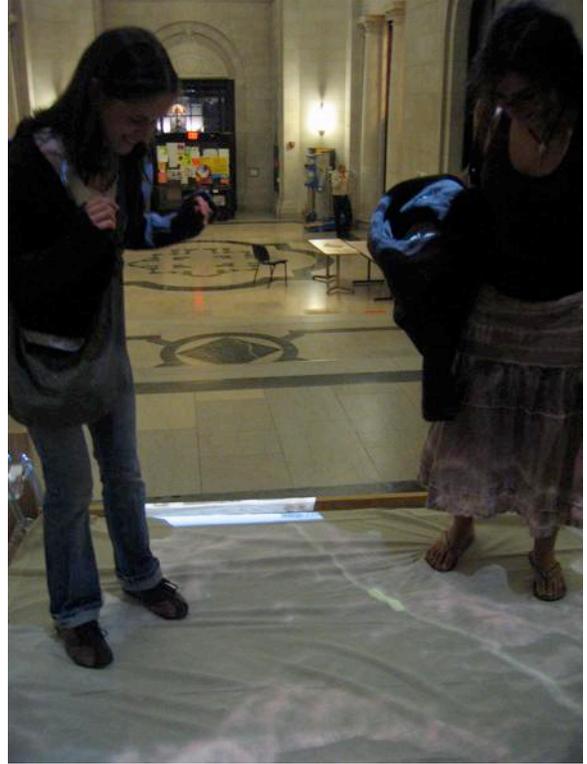
The Drift Room prototype floor



Tajin with an excessively long VGA cable made out of ribbon wire.



Chang practicing the crane kick on the Drift Floor during our secret black-ops installation in the CFA's main hall



We attracted about 25 random passersby to try out the Drift Floor on the night of May 10, 2006. Here are a couple of girls looking at each other's feet.