“Lobby Pets”

An interactive projection

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ABSTRACT

The LobbyPet is an interactive playmate devised to entertain in the monotonous periods of your day. Just like a pet brings comfort when you get home, the LobbyPet comforts and entertains you while you wait for an elevator, stand in line for food, or various other dull times of the day.

Your LobbyPet responds to your voice, so he'll come when you call him. However, he doesn't like it too loud, so don't yell at him! He may hide at first when you bring over a large group of people, but if they're nice to him, he may eventually come out to say hi.

Calling out to "Jim", the lobby pet!

Contents

1. Motivation 1

2. Research - the precedents 2

3. Concepts 4

4. Implementation 6

5. User Testing - the Setup 7

6. User Testing - the Response 9

7. Future Possibilities 10

8. References 11

Motivation

How does one create engaging experiences? How can interaction enhance the meaning and use of a public space? How can an intervention make a place more friendly and warm for people to interact with one another?

To discover answers to the above, our class explored the creation of a mediated play space in a public place, through means of an interactive projection. Our group in particular chose the 2 W13th Street (New York) - its10th Floor Lobby to conduct our experiments.

The 10th Floor houses the Design and Technology department. A lot of people cross the lobby while going to and from the elevator. How does one make them stop, notice and engage in play by interacting with a projection?

Research - the precedents

(a) Delicate Boundaries - Chris Sugrue

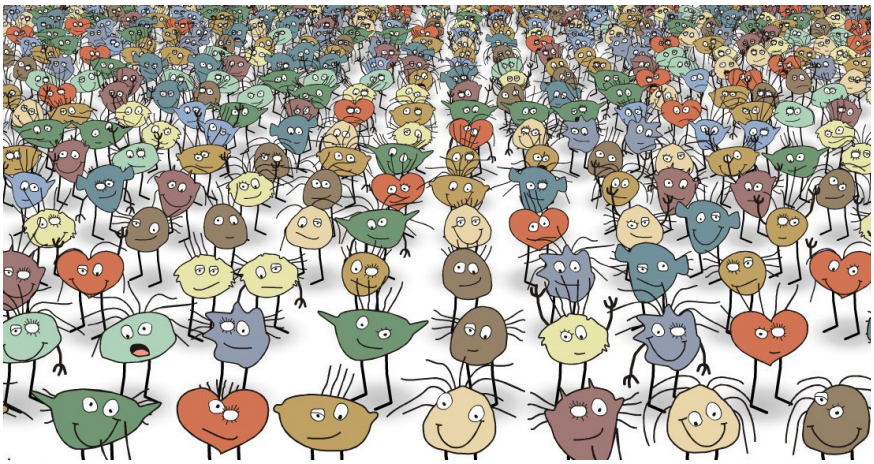
Traditional projection based projects usually focus at a display where the interaction plays out. Sugrue's project is an novel way of taking the action out from the computer screen/touch-screen/ table, onto your very own surface of choice (including yourself). It enables the characters to come to you and be a part of you.

Delicate Boundaries by Chris Sugrue

(b) Motion Tracking - Jeff Han

Motion Tracking uses blob detection to locate users and lock their position. The position values are used to project a spotlight around them which follows as they move around the space (in the case of this image, the space is the locale of Ars Electronica show 2003).

Blob Detection by Jeff Han at Ars Electronica



Combinatoric Critters by Jared Tarbell

(c) Combinatoric Critters by Jared Tarbell

Combinatoric Critters are computational creatures that are randomly generated with values for determining various aspects for the creature, like eyes, nose, mouth. Each critter is therefore a unique individual with a unique character.

Example file from Blob Detection

(d) Processing Libraries

We browsed through many examples in the open source Computer Vision and SoundLibraries of Processing to get an idea of the myriad of things one could do for interaction. The libraries we primarily tinkered with were as follows:

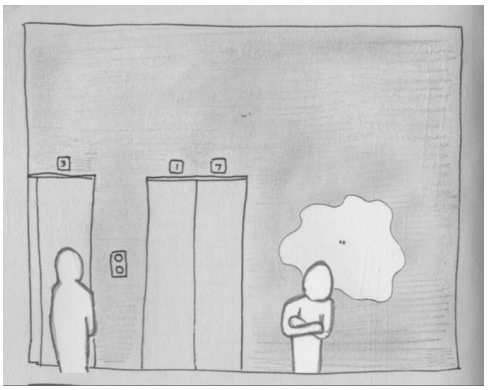
Minim by Damien Di Fede
Blob Detection by v3ga
Background Subtraction by Golan Levin

Concepts

We explored many concepts to answer our question. We cast our net wide on the first round of prototypes in order to gain an understanding of the project's boundaries.

(a) The Lobby Pet

A software organism that lives in the 10th floor lobby. With a small amount of activity the creature becomes curious and will come out and see what is happening. If too many people and too much commotion is going on it would run away scared. This prototype was well received and was iterated upon.



(b) Picture Comparison

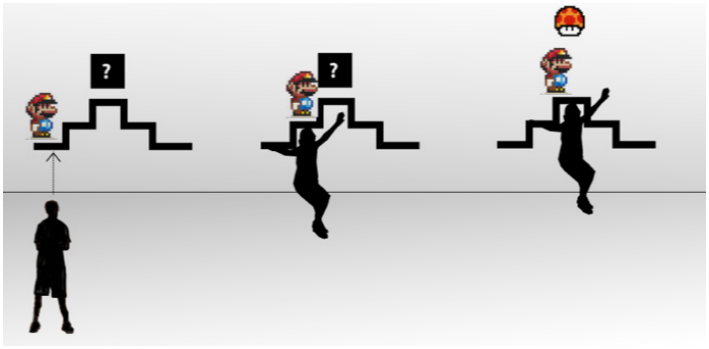
Here a stock of pictures would be projected in the lobby two at a time. People could vote on which of the two images they favored. After a period of time the data collected from people voting would be compared and the favorite picture would be known. Though the crowd-sourcing component of this concept was interesting it was agreed that interaction was limited.

(c) Mean Creatures

Inspired from Egyptian scarabs chasing intruders in The Mummy (film), this projection would release a host of organisms to swarm behind people.

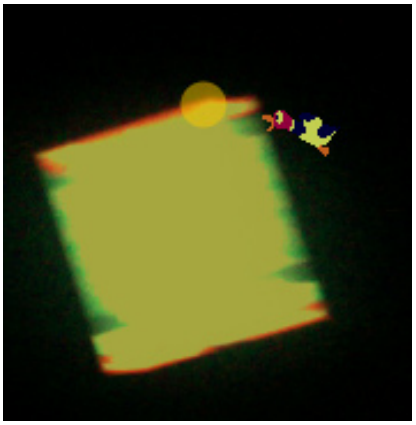
(d) Super Mario Game

A game triggered by people's interaction with the projection. They would utilize their whole bodies to play with it.



(e) Confetti

The idea uses tangible confetti as an interface. The confetti would generate forms on the wall lending to a mixed-reality experience.



(f) Duck

What would you do if the two options were to either feed the duck or shoot the duck? The idea sort of plays around with such questions, and a flying duck.

The Implementation

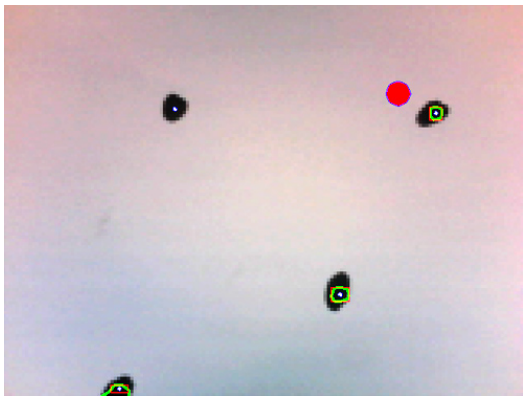
Post-ideation, our ideas went through several transformations.

1. response via blob detection
2. interaction with Confetti
3. interaction via sound

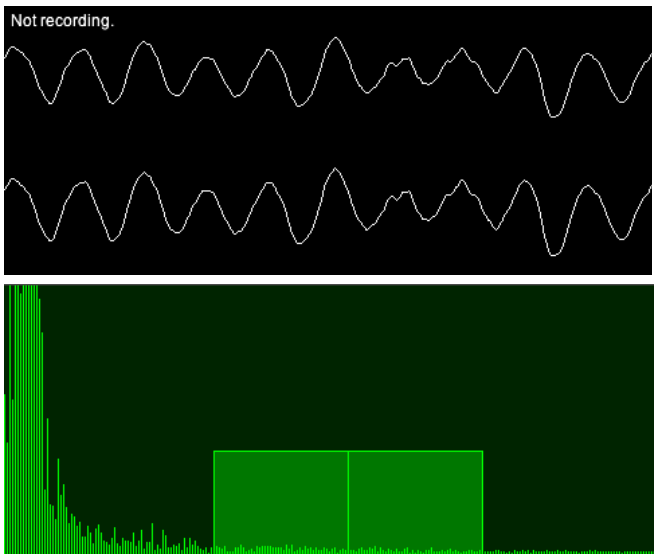
We identified the projects key mechanics:

1. interaction with environment
2. movement/personality of Pets
3. Look and feel of pet(s)

We continued the prototyping on these key mechanics. Many of these were implementation prototypes; attempting to discover methods of production. At the end of this process we settled on the sound based installation. We utilized an earlier prototypes drawing routine for the creatures look and feel as it was flexible and had personality. With our method and look and feel worked out we began our final round of testing.

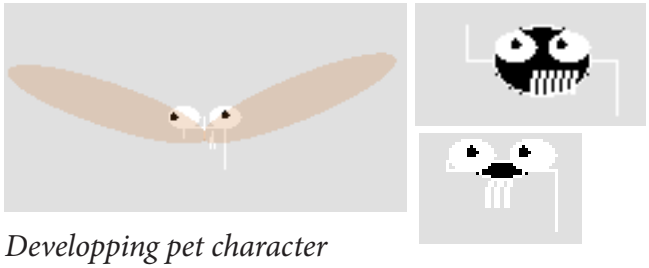


Blob Detection to register confetti



Computing interaction via sound

Registering response via Blob Detection



Developping pet character

User Testing - The Setup

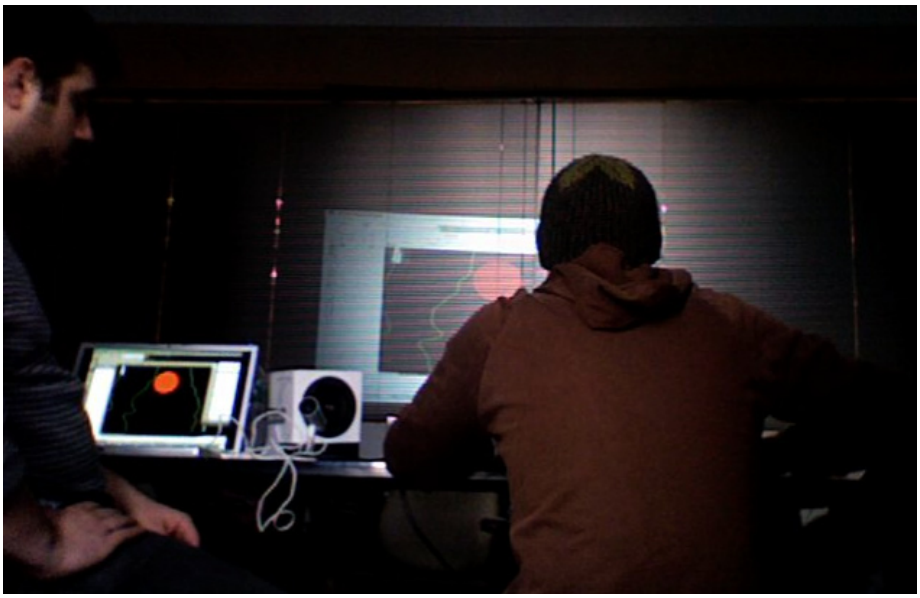
Setting up the projection was a new challenge in implementation. We first tried out the set-up in our original location - The first floor Parsons Lobby (2 W13th Street, NY) near the elevators.

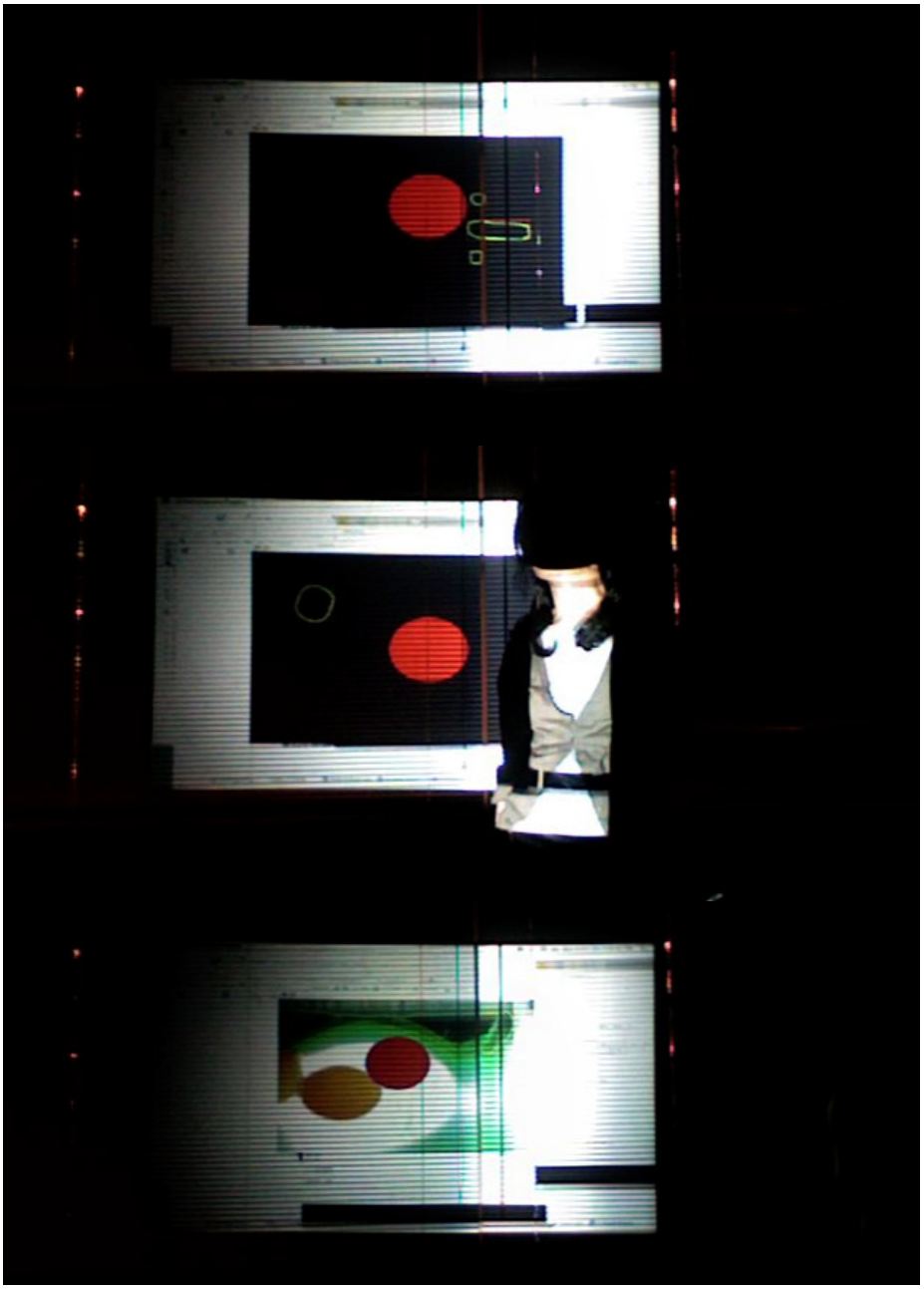
We faced several hurdles, some unanticipated ones:
(a) Wall color: The color of the wall chosen for projection and lobby lights made the projection quality very low. Not much was visible.
(b) Projector mount: There was no naturally available projector mount and people's shadow was obstructing the lobby pet image.
(c) Projection scale: Since we had coded the moverment of the creature on the computer, we realized that the scale difference of screen and wall affected the speed of creatures movement. It was not very gradual and not in sync with the blob detection. It was realized that modifications to th ecode should be done on the fly in actual scale.

It was therefore decided to shift the projection location to the 10th floor Lobby. The shift took care of all anomalies, while code was adjusted on the fly to sync with the scale of the lobby's wall. Taking faculty suggestion, we also adjusted the projection edges, so that they lined up with the edge of the wall, making the projection seamless and look natural (instead of artificial).

Setting up projector in the main Lobby

Low visibility. Nothing can be seen on the wall.





User Testing - The Results

We preformed two final user tests. Each lasted over nine hours and each tested different variations. The first version presented users with a creature that responded directly and instantly to the users voice. The interaction in the second version was less direct and less responsive. The direct response of the first version prompted our tech minded testers to ask questions about how the technology was working. This was not desirable. If a user is asking about how something works, they are not engaged in the project.

The second version aimed at addressing this issue. In this version the same algorithm was employed to detect the sound but the creatures response was one step removed, delaying the response and making the creatures movements more organic.

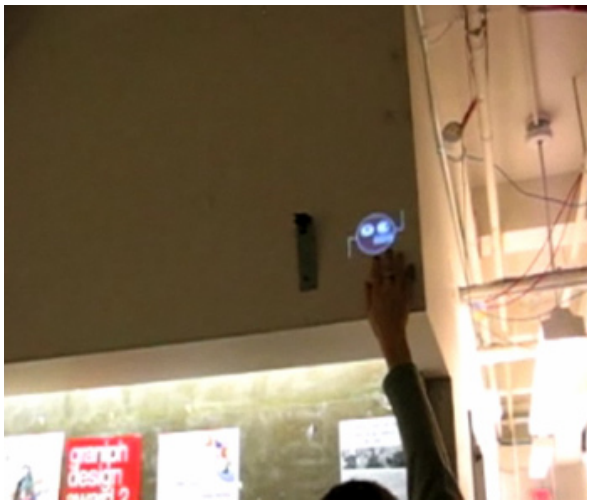
User tests revealed an expected response as well as some unexpected findings.

>>Effect on Lobby Traffic was as expected. People waiting for elevator responded and interacted with the pet as we had hoped.

>>We were interested to find that some users were shy to use their voice

>>We were pleased when some users thought that pet responded to words and tried using mean and nice words to affect the pet. This reaction meant that people were engaging with the lobby pet at a human level.

Calling out to Jim....



And Jim comes to you!

Future Possibilities

Overall our group was please with the final outcome. Within a matter of weeks we were able to go from experimenting with an unfamiliar technology to building a complete and working project. Despite our success there is much still to be done:

1. Confetti interface.
2. Making creatures respond to “meaning” of words
3. Enhancing creature movement and behavior
4. Using our creature to create a learning space for children
5. Further exhibition.

Final iteration (set up on 10th Floor lobby)

References

(a) Processing Libraries:
#http://www.processing.org/reference/libraries/

(b) Precedents:
#Jared Tarbell (http://levitated.net/bones/walkingFaces/index.html)
#Chris Sugrue (http://csugrue.com/delicateBoundaries/)
#Jeff Han (http://cs.nyu.edu/~jhan/tracking/index.html)