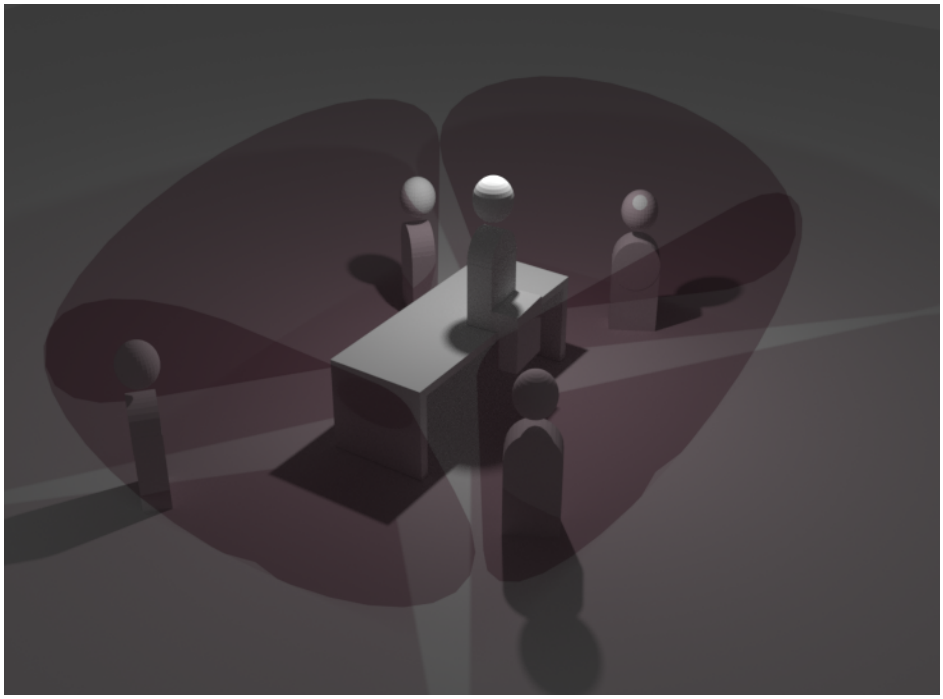
Nov 2, 2017

Owen Coolidge
“Then” Proposal

I enjoy the idea of inanimate, familiar objects being given abilities that contradict our immediate, natural impressions of them. I want to make a piece of furniture that features a proximity sensors and cameras, data storage, and a computer. Over the course of its lifetime: weeks, months, but hopefully, years, the piece furniture would be able to collect enough data about its surroundings and, through statistical learning and computer vision techniques, it would be able to understand the world around it in its own way. Imagine it as the bench in an art gallery, its function for us is to be sat upon, but little do we know, it is thinking critically about the world around it and building a representational model of its environment in which we are just a part of. The reason I want it to be a piece of furniture is because I want it to blend into its environment and not catch the eye of any objects of the environment; in this case the “objects” would be humans.

Google’s Deep Dream uses machine learning and neural networks to find patterns in images and generate it’s own understanding of them. The process’ that are used to create these images are similar to what I want my computer to do. Getting to fully understanding machine learning with tensor flow and neural networks might be a bit ambitious for this project, but I hope to accomplish a level sophistication in my program that will allow an extraction of meaning from the data collected. Also, I will need a very large amount of data in order to do anything interesting. This is why I



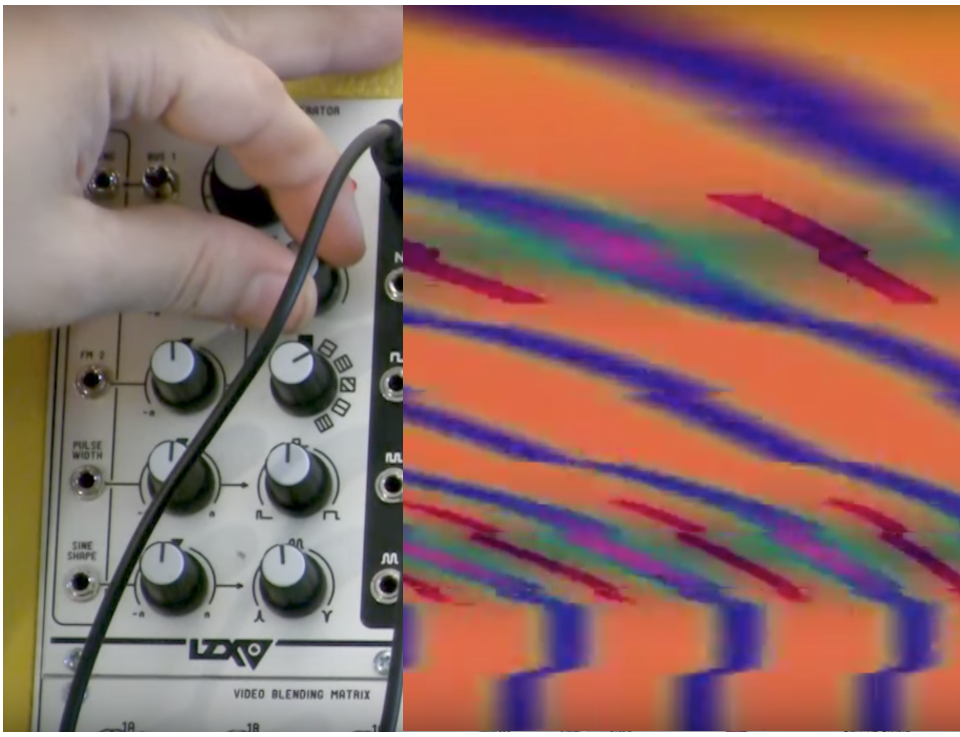
Modeled representation of my object’s funcitonality. The rectangular object in the middle is a bench and the red cones are visualizations of its view.

Google’s Deep Dream image generator

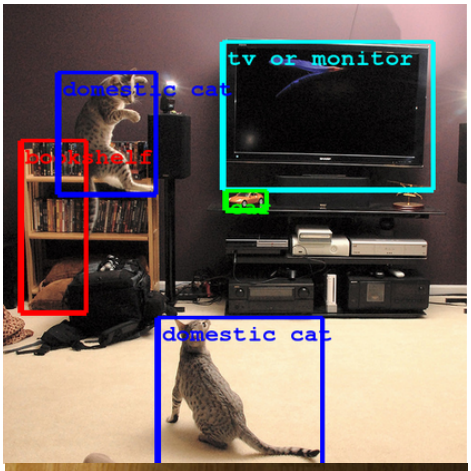
specified earlier that the lifetime of my object will be upwards of a year.

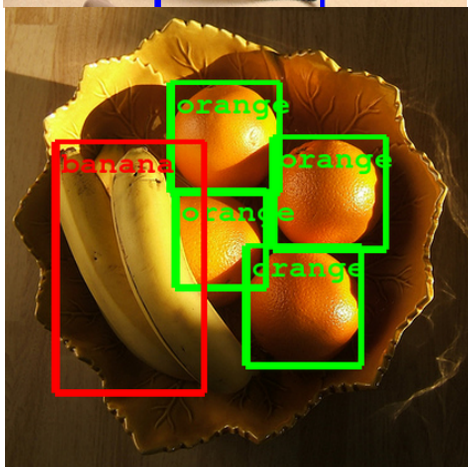
LZX Industries creates analog synthesizers for audio and video. The strange, morphing, wonderful visuals are direct graphical representations of the audio that is generated concurrently. I intend to replicate the way that these machines are able to generate video that is a direct reaction to switch flips and potentiometer adjustments but also looks like an expressive representation of the audio.

In order to display the data it collects, my object will feature a video output. The content of this output will look somewhere between the video output of the visual cortex by LZX industries and Google's Deep Dream image generator. This is the most difficult part of the whole project. The object will understand the world around it, but this understanding exists within the framework of its own "brain." Representing its knowledge visually in a meaningful way means translating the way it thinks into the way we think. I do not want this visual representation to be similar to common visual representations of computer vision where objects in the computer's view have boxes around them with tags of what the computer thinks they are. This is a human centric approach which implies that the end product of a computer's processes are supposed to appeal to humans first and foremost—as if the computer can't represent its knowledge in a way that more closely represents its own understanding of the environment. Extracting the computer's illustration of its environment gets to the core of what my whole project is about: using sensing and computational technology to reflect on ourselves and our environment. This reflection will be motivated by stark contrast between my



LZX Industries' "Visual Cortex"





"Traditional" Methods of illustrating a computer vision algorithm's knowledge.

object's view, which hints at a certain level of comprehension of its environment and our view. If my object outputs an image of its environment that closely resembles what we see when we look at the same environment then I have failed.

Chris Salter's piece, N-Polytope, is a physical recreation of a neural network which perfectly encapsulates concepts of machine learning and cybernetic systems that I want to tackle in my project as well. In N-Polytope, there are a large network of sensors and actuators in the form of mics, light sensors, speakers and LEDs, as well as a microcontrollers that, all together, illustrate a group of semi-intelligent machines communicating with each other in a close to indecipherable way. Not completely indecipherable however because it is possible to recognize patterns and deduce the logic behind the network's communication purely through observation of its behavior. I want my object to be similar in that its outputs are encoded in machine-speak but are still comprehensible to the observer.

Created by Phillipp Schmitt, "Computed Curation" is a photo book created by a computer. Each image is captioned with what the algorithm thinks the image's contents are. Among the many captions that are surprisingly correct and the many more that are way off, there are some that triggered me to reevaluate the image. As if the computer's analysis picked up on something of substance, however minute, within the image that I didn't even notice. I want my object to trigger this same feeling that prompts us to reflect on, in my case, the environment. I think these machine learning algorithms can be used as a tool to open our eyes to seeing the world in a new way.

"N-Polytope" by Chris Salter

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a man walking down a dirt road
[confidence: 62.0626631100272%]

Dead Sea, Israel. October 2015.

mountainous landforms, landform, geographical feature, natural environment, wilderness, mountain, badlands, rock, soil, wadi

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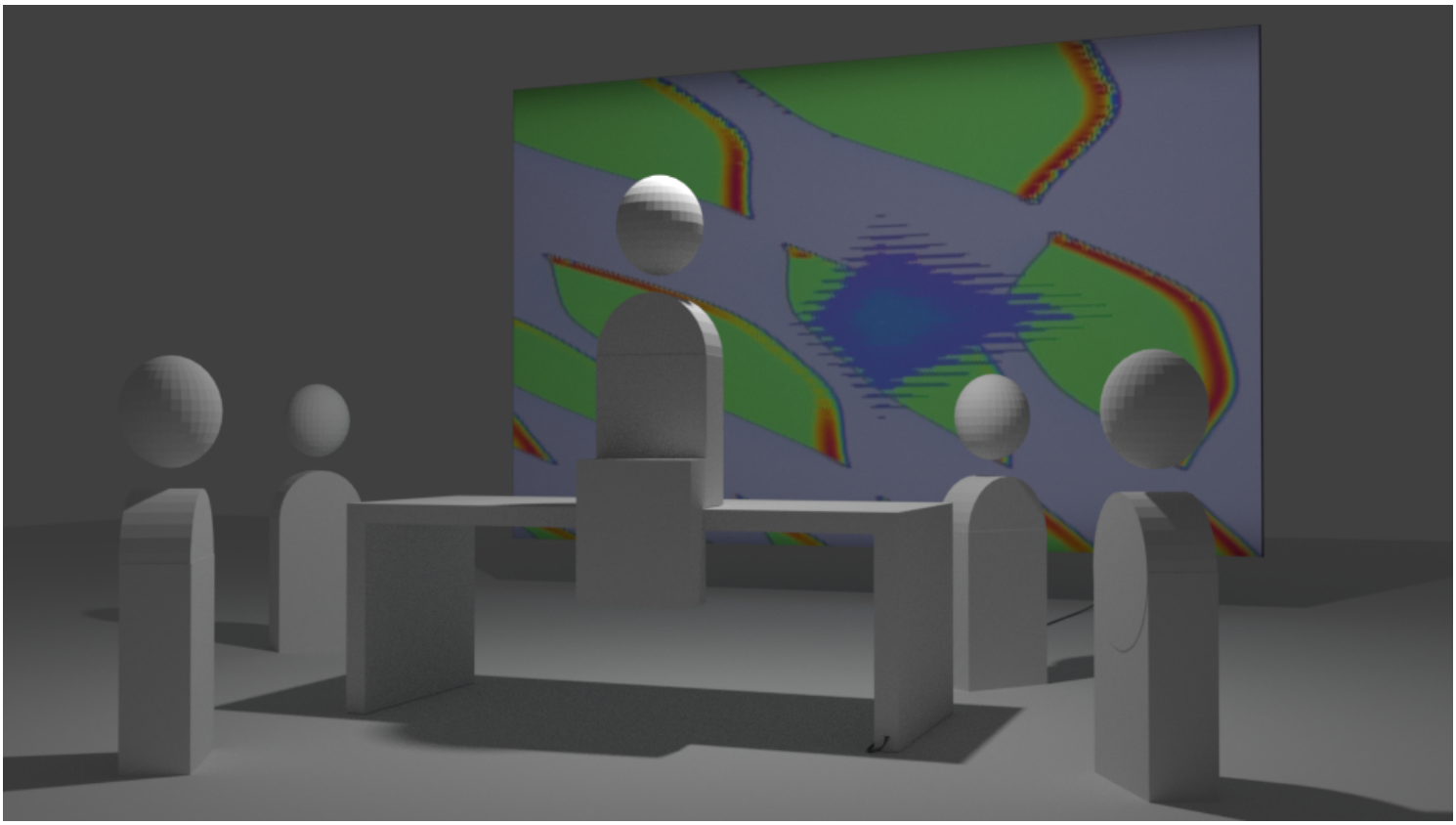
Page from "Computed Curation" by Phillipp Schmitt



Secondary image illustrating my object in a gallery space hooked up to a projector.
Image projected is from the Visual Cortex by LZX industries.

Image Sources:

Google Deep Dream Generator:
http://www.deepdreamgenerator.com/

LZX Industries:
http://www.lzxindustries.net

Image from blog by John Melonakos:
http://notonlyluck.com

N-Polytope:
http://chrissalter.com/

Computed Curation:
https://philippschmitt.com/computed-curation-web/