Design Document  
Work In Progress

# Project Overview

We are creating a digital, interactive art installation for a high traffic, public area that allows for both passive and active interaction. We want to use the people passing through the space to create pseudo-random content within the installation. Active users can then interact with this content in real-time.

The experience will be centered on a large projection screen. It will cycle through various graphical scenes (dynamic pieces of digital art) simulated in real-time. The displayed content will be similar to an audio visualizer in that it will take data from multiple sources (ex. User interactions) and display them graphically in an artistic way. In its rest state, the system will play back previous interactions to create interesting images which should entice new users.

We will use cameras to detect people entering the space and each person will generate a unique item in the scene, such as a particle, that will appear on the screen. These items will play a larger part in the scene than any system created or controlled graphics, and they will move across the screen based on the person’s direction of movement through the space. They will also drive user interaction by affecting the scene in interesting ways, such as sound or graphics, whenever the items are affected by active user interaction.

The interaction will come from active users in front of the screen using their body movement to influence the scene.

# Technical Requirements

## Software and Technology

* OpenFrameworks 0.8.0 with OpenCV and Kinect Addons
* Visual Studio 2012
* Adobe Photoshop and Illustrator CS5
* FL Studio 11

## Hardware

* 1 Kinect for Windows
* One computer with:
  + 4 USB connections
  + output for one monitor/projector
* 2 web cameras
* 1 projector
* 2 50ft. USB extension cables
* 2 speakers
* Sound mixer and appropriate cables

## Materials and Tools

* One large projection screen
* Tape

# Feature List

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| User Features | Description |
| Use body movement to influence graphics | User will stand in front of the screen and use their limbs to manipulate the simulation |
| Use body movement to manipulate of sound | The sounds in the simulation will change depending on users manipulations of the graphics |
| Entering the space generates simulation items | When anybody walks in through the space a new graphics item is generated in the simulation |
| Moving through the space affects the simulation | Peoples’ movement through the space affect the items in the simulation that were generated upon entry |

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| Design Features | Description |
| 4 unique graphic simulations (scenes) | Multiple artistic scenes that incorporate interaction data from active and passive users |
| 20 non-intrusive sound effects | Approximately 5 sounds per scene. Sounds will be similar to the “21 Swings” project in Montreal |
| Unique art assets (amount depends on final scene designs) | Created with design software to be displayed in the various simulations |

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| Technical Features | Description |
| Skeletal movement data | Tracking hands and feet through Kinect for up to 2 active users |
| Detect passive users’ movement | Use vector cloud data through OpenCV and web cameras to read user movement through the space |
| Detect passive user presence | Blob detection with OpenCV and we cameras to track users and their movements through the space |
| Visualizer Program | OpenFrameworks program which cycles scenes and visualizes our simulations |

# Milestones

Jan 31st

* Preliminary technical research
* Preliminary scene designs (4-6 mock-ups)
* Running OpenFrameworks project
* Preliminary code design
* Look into acquiring necessary equipment

Feb 2nd

* Scene designs finalized and chosen
* Finished design for code
* Simple project with simulated user input for scene testing (mouse)

Feb 14th

* Art assets created for all scenes
* Varied interaction for each scene
* Preliminary designs for audio

Feb 28th – Submission

* Project reading raw Kinect data
* Fully implemented set of scenes with distinct looks
* All audio samples recorded/acquired

Mar 7th

* Kinect data influences simulations
* Scenes with distinct Kinect interactions
* Preliminary audio functionality in scenes

Mar 14th - Working Prototype Demonstration

* Kinect functionality complete and debugged
* Audio fully implemented in scenes

Mar 21st

* OpenCV reading data from webcams

Apr 2nd

* Webcam data creates items within simulation

Apr 16th - Project Complete

* Project has run and
* Project complete and debugged

# Team Members & Roles

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| --- | --- |
| Ryan Bottriell | Lead Developer |
| Zara Tooth | Developer, Manager |
| Marco Brito | Lead Designer |
| Matthew Fournier | Designer, Developer |

\*All members were present and involved for the writing of this document