iCreate - Generative Design in Architecture

Group 61: Hannah Solorzano, Nabeel Shariff, Rhea Mae Edwards

Project's Purposes and Goals

- Intuitive user interface and generative design
  - Offer a user a way to turn sketches and gestures into complex 3D objects and structures
- Allow the user to interact with the virtual environment

Code Walkthrough

(Shown through Video Demonstrations)

Requirements Met

- External Interface Requirements and Performance Requirements Met
- Functional Requirements:
  - VR Environment
  - Object Library
  - Curves
  - Transformation and Translation
  - Save and Load
- Further described in code walkthrough

*What's Left

- Completing the stitching of all of the project's implementations into one
  - Parts that are still separate from the others
- Then the project will be Release-Level ready!

Problems Impeding Project Completion

- Meeting times with group members
- Merging Codebase and Squashing Bugs
- Unity

Hannah

Algorithmic Curves

- Algorithms

- Attach curves to menu buttons

Hannah

Other items to consider

- VR environment
  - Main Menu
  - Building space

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Video Demonstration of Current Project Implementation (Release-Level*)

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Expo Poster

Virtual Reality is the next best way to interact with technology. It allows us to experience the impossible, and create what we could only previously imagine. It puts you in the middle of the action and makes you the center of attention. With our program, you can experience VR in a unique way by giving your imagination a design and bringing it into your own virtual reality.

Nabeel

COLLEGE OF ENGINEERING | Electrical Engineering and Computer Science | CS61

DESIGNING IN VIRTUAL REALITY

Generative 3D Design in Architecture

STORY BEHIND THE PROJECT

Today's computer systems utilize many forms of user interfaces that allow users to seamlessly interact with their electronic devices.

Alternative methods of user input and interfaces are becoming more popular, creating a basis for a new generation of user interfaces for architectural and industrial designing.

OUR VISION

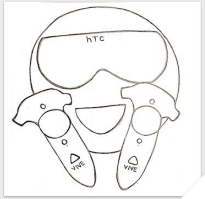
Goal: To improve the efficiency of the interaction between the user and the program via multiple innovative modalities.

The team has used the Unity game engine and Steam VR's virtual reality plugin to develop the program that puts the power of creation in your hands. Literally.

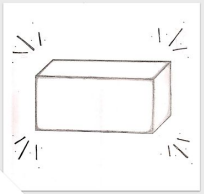
Simply pick up the HTC Vive controllers and headset to bring your imagination to life!

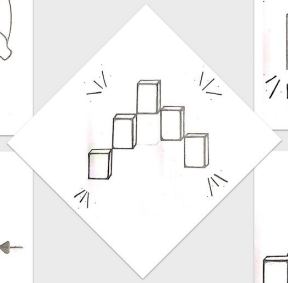
Oregon State University

1 HTC Vive Headset and Controllers

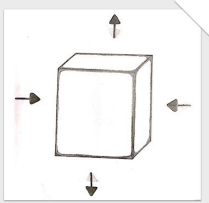


2 Generate 3D Object



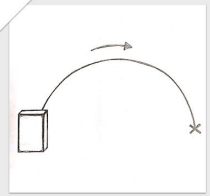


3 Resize 3D Object



5 Watch Structure Become [Virtual] Reality!

4 Draw Trajectory



DESIGNING EXPLANATION

Power of Unity + Experience of VR + C# = An intuitive tool to create complex structures out of simple gestures and ideas

1) 3D objects can be spawned by selecting from the in-game menu via an HTC Vive controller.

2) Objects can be resized, combined, and altered according to the user's whim.

3) Curves can also be drawn mathematically, and then changed into various 3D structures.

4) Save and load objects and environments to come back to or continually cherish creations.

WHAT HAPPENED IN THE END?

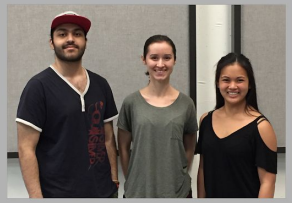
Usable HTC Vive Compatible VR Program!

Successes:

Program meets basic requirements of generating various 3D objects and creation of trajectories with mathematical curves, along with save and load functionalities.

Limitations:

User is unable to free-draw a curve and delete objects within a scene (program restart is needed), but these additions are in the works for the future.



(Pictured from Left to Right)

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