Creating Game Scenes in Virtual Reality

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CSE 493V
VR SYSTEMS

PROBLEM

- When designing levels for these games, the editing tools can be clunky and difficult to learn.
  Take the level editing process of game development
- and transport it into VR space creating intuitive and efficient real-time terrain sculpting.

METHOD

- Utilize Unity's built in Terrain Map, building ontop of this to create custom brush styles and sizes to interact with the terrain.
- By transporting terrain level editing into VR we have given the designer a better sense of depth and control. This leads to more creative and intiuitive landscapes (see image to the right)

RESULTS

a development environment in VR for sculpting terrain in real-time.
- Users are able to interact with our menu interface to choose between different sizes and styles of "brushes," and are then able to use VR controllers to interact with the terrain accordingly.

Tip 1: Point the ray where you would like to raise/lower the terrain, then press and hold the trigger.
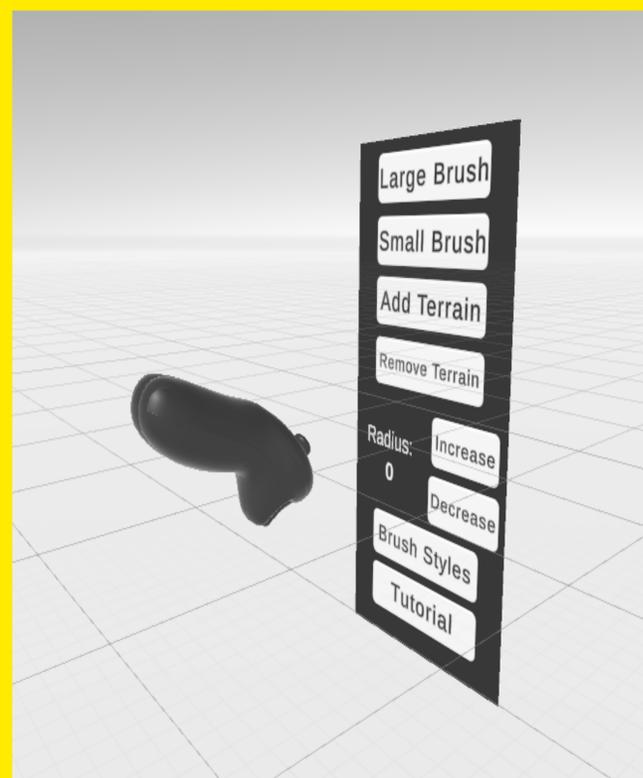
Restart Next
Exit

IMG 3: Here is an example of our menu interface where a user can follow a tutorial to learn how to use the editor.

While VR is traditionally used for playing games or experiencing virtual 3D worlds, in this project we have taken VR out of the gameplay world and utilized it for game creation itself. Utilizing Unity's height terrain map feature, we have made a VR level editor that has begun to explore this possibility in an intuitive and fun way. This means we are using known calculations and algorithms to determine what terrain to alter, and in what way, and our novel idea is to bring this into the world of VR. Building off of the key skills of game developers before us, we simply enabled a user to be able to sculpt land while in the VR environment. This allows the user to build the terrain around them as they are immersed in VR, so they can see what their world would look like to a player in real-time. The challenges this brings on top of implementing known (non-VR) techniques include creating an intuitive and useful user interface, as well as implementing the functionality for users to interact with the terrain using VR controllers instead of the standard mouse and keyboard.

Large Brush
Small Brush
Add Terrain
Remove Terrain
Radius: 0 Increase Decrease
Brush Styles
Tutorial

IMG 1: Image of the menu screen, showcasing options for different brush sizes and styles, as well as the tutorial option
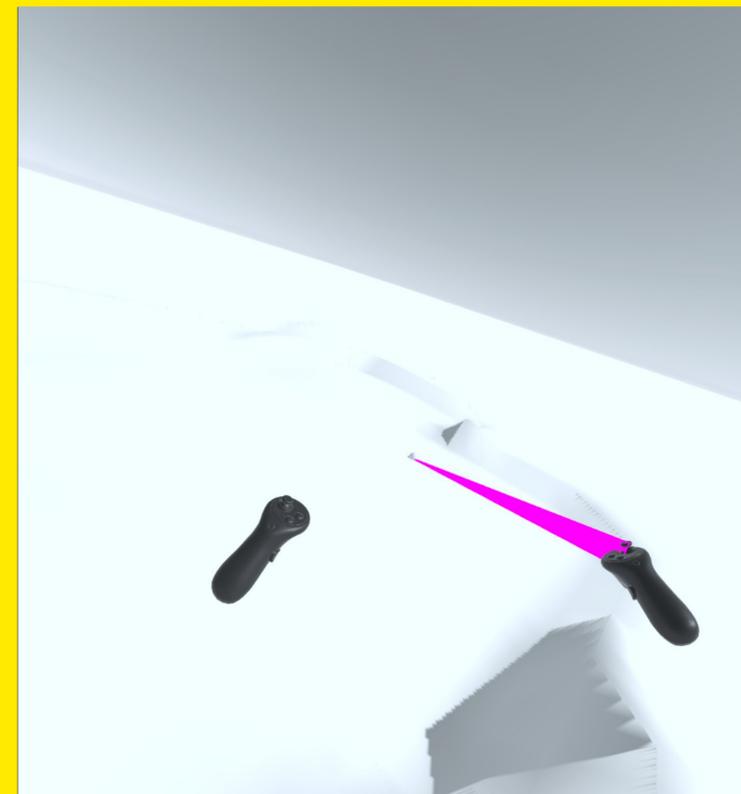
IMG 2: Our VR sculpter in action, the magenta ray is where we are currently sculpting, and it is controller by the VR controller the user holds.

YOUR APPROACH

- Currently, VR sculpting is mainly used for clay-like art applications
- Create an intuitive user interface that allows user to change how they interact with terrain
- Allow user to change size and style of brush, including a Gaussian option to create more natural curvatures
- Intuitive user interactions using "ray" style VR controller for precise movements

Future Work

Future improvements include:
- Adding exporting feature so users can import terrain they sculpt into other projects
- More brush styles, sizes, and overall functionality that is on par with current non-VR terrain editors
- Accessibility for left vs right handed sculpting

REFERENCES

Unity Documentation :
- Unity Custom Editor Tools
- Unity Terrain Documentation
- Unity VR Support Tutorials

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