Introduction

Man in the Mountain is a self-contained product created for the 2018 Microsoft TEALS conference at Puget Sound and any future TEALS conferences so long as Eastern wants to use it.

Overview

This program generates virtual terrain based off a webcam feed using Unity. The Unity engine was chosen for this program because it is free, provides many built in functions, and is portable to most systems. EndlessTerrain is the core class of the program. It updates and delegates to the rest of the program's components.

How to Get Started

This product was developed in the Unity engine and was developed using version 2017.3.0f3. Also, if it is desired to edit the version that uses OpenCvForUnity then that Asset is required. Webcam is required for testing and use of the product. This program may not run well on a low-end machine.

Suggestions

The garbage collector should be optimized. Currently, each frame (called via Unity's Update method) several megabytes of data are disposed of as the garbage collector discards the previous vertex normals and various vertex positions stored on the previous frame. This causes the call to RecalculateNormals to have to iterate through the entirety of the mesh, or more specifically, the various MeshData objects that compose the overall mesh, and calculate the vector normal to each triangle in order to accurately map textures and "sew" the various triangles together in order to form the 3D MeshData objects which then in turn compose the overall mesh.

OpenCVForUnity

OpenCVForUnity is a paid package from the Unity asset store that our group purchased and imported into our project. We originally intended to use it for color detection, but our project no longer supports color detection, and it is now exclusively used for face detection. OpenCVForUnity should not be uploaded to GitHub. Since it is a purchased package, it cannot be distributed to people not working on this project.
https://assetstore.unity.com/packages/tools/integration/opencv-for-unity-21088
OpenCV is an open source library of programming functions mainly aimed at real-time computer vision.

https://opencv.org/
https://hayo.io/computer-vision/

What Didn't Work

Initially, we were going to use OpenCVForUnity for color detection. Then, we were going to generate terrain where certain colors were detected. Different terrain types represented different colors. For example, blue represented water, green represented grass... etc. However, we found that the current iteration of the program was more visceral and engaging considering our goals and the space we had in the conference.