

CMPT461 Final Project Report

Spring 2022

Background Selection Application

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Github: <https://github.com/KeYu-Red/CMPT461-Project.git>

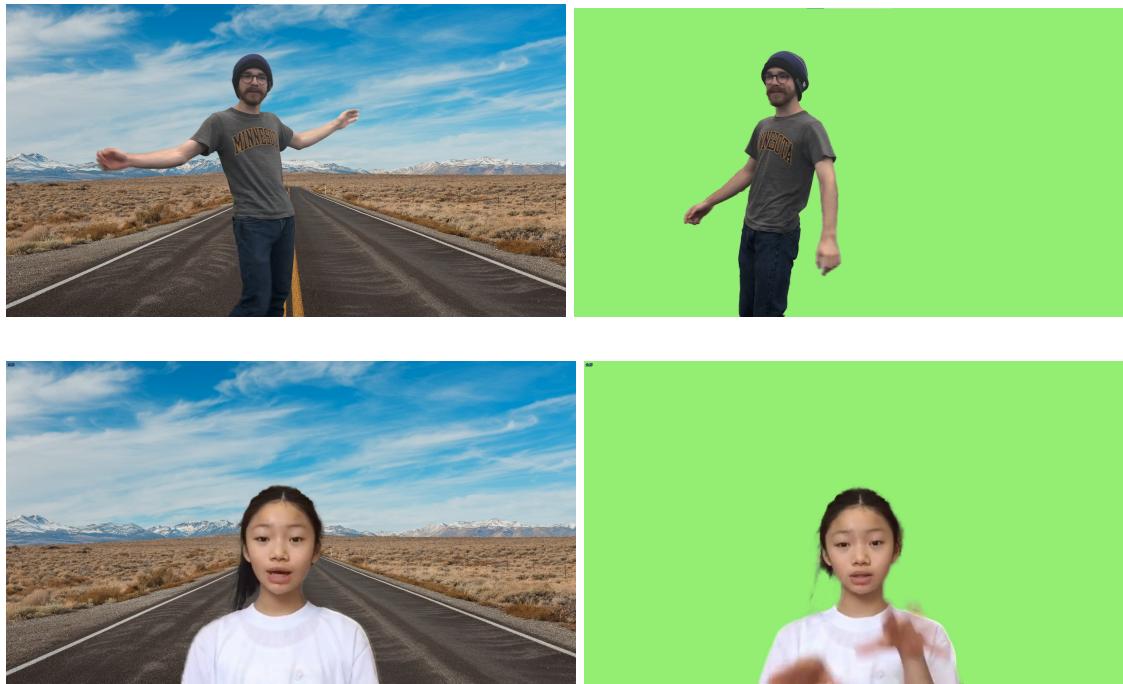
Motivation

Background subtraction is a problem that still struggles to find a solution that is near perfect. However, some models take the background image of the original video as an input and use it to remove the background resulting in much better results than most models out there. As a user, it is very hard to provide a background image of a video where the background is static (i.e., not changing/moving).

Approach

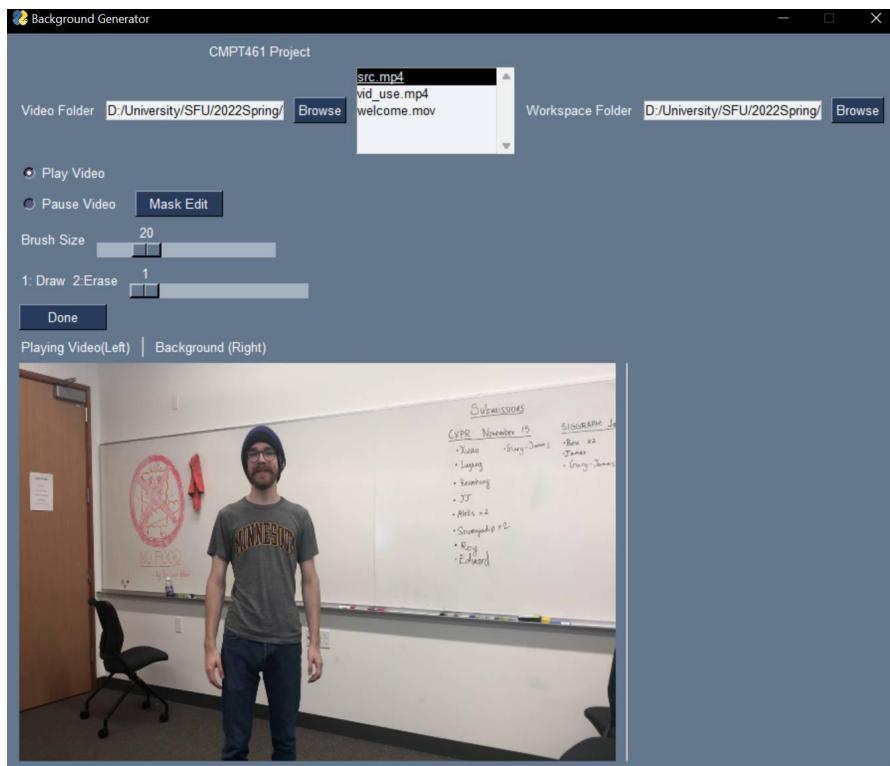
The idea is to create an application that will enable the users to select a video of their choice and interact with that video to select as much as the background possible. The user pauses the video at their desired frame and uses the brush to paint over the background. This will generate an image with as many background images as the user selects. When the user is happy with the result shown on the right-hand side, they can press “Done” and let the Background Matting V2 model (<https://arxiv.org/abs/2012.07810>) take care of generating two videos, one with a green screen and one with a background image of a road.

Results



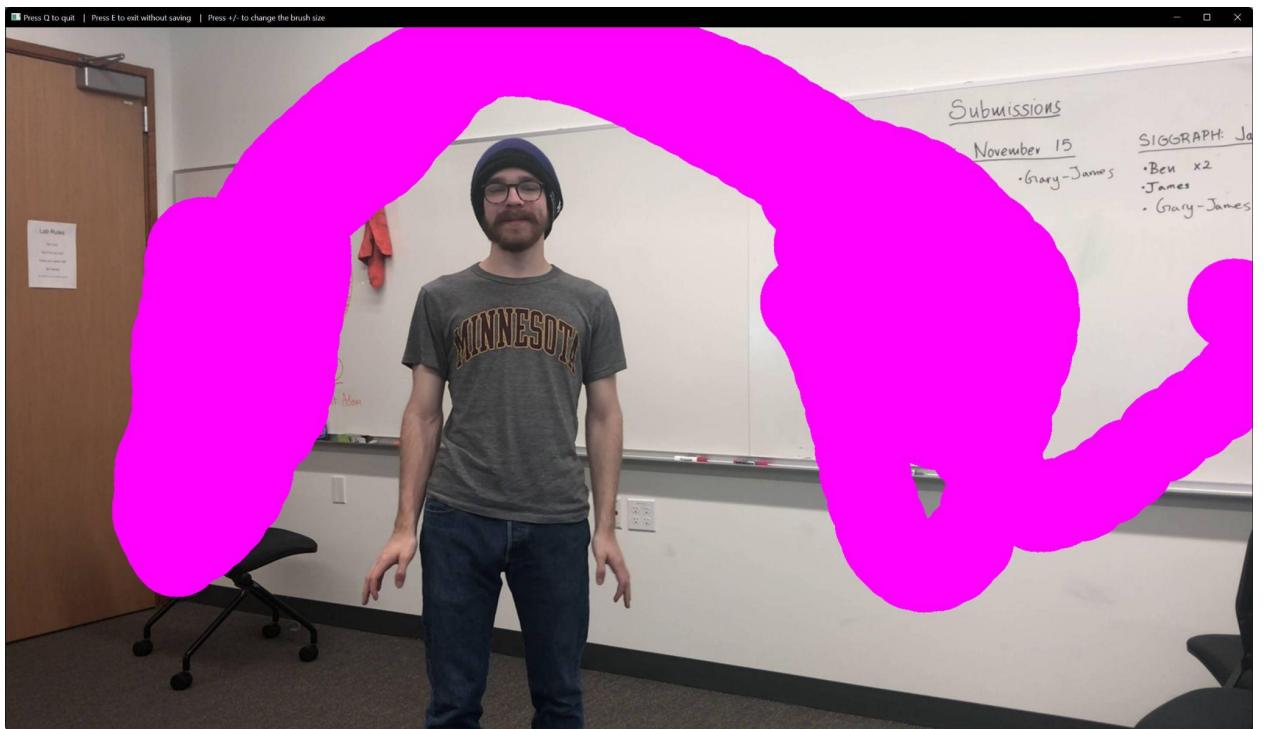
Implementation Details

- User Interface



Many GUI libraries are being used nowadays, since the project needs some functionalities which can be achieved in python, we choose to use ‘pysimplegui’. This is straightforward, and it is not difficult or painful, but quite fun.

- Extract Background



We use OpenCV to draw the area of the background. To achieve this, it uses OpenCV-named ‘Window’ to create a window and uses a mouse click callback to achieve the user interaction. This is then converted to get the updated background image shown on the right-hand side of the playing video.

The user can finally press the ‘Done’ button to get the videos mentioned in the approach section.

Work Division

Saqib: Set up the model and model-related code, helped in making the application, helped in making and recording the video, and helped in writing the report

Harry: Set up the application, helped with code related to the model, helped in making and recording the video, and helped in writing the report.