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Colour Separation Overlay using CNN Model.

Ayush Kumar[1], Sobhit Tomar[2], Kumar Aryan Amrendra[3], Preeti Suryawanshi[4]

Abstract— We have proposed a method for creating a green background used in image production that allows an image editor to add visual effects in post-production through an editing technique called chroma keying. For unstructured applications like displays with natural light, shadows, and marks on them, we propose a completely automatic and real-time green screen keying system. To identify the background from the foreground in the absence of regulated illumination and adequate human direction, a highly robust segmentation algorithm is required. When time is restricted, the robust CNN model struggles to attain both high robustness and good pixel-wise precision

Keywords— **background, visual effects, chroma-keying, Convolution Neural Networks, foreground.**

I. INTRODUCTION

Colour Separation Overlay is a widely used and popular technique used in everyday life, in movies, in video production etc. Thanks to the rapid development of computer graphics, the compositing shot has become a common choice in the film and television industry. Alpha or digital matting is the accurate extraction of a foreground item from any media source that is images, videos etc. It is essential to the process of editing images and videos.

Green/blue screen keying plays a crucial role in image/video compositing and has already shown its production-level matting quality in many applications. In this project, we are using the Colour Separation Overlay method which uses a convolutional neural network (CNN or ConvNet).

The proposed project is based on CNNs which are particularly useful for finding patterns in images to recognize objects, classes, and categories.

Using the compositing equation, $I = F + (1 - \alpha) B$, where F and B are the foreground and background colours of pixels that are linearly combined using z to represent its observed colour I, the process is mathematically represented by thinking of the observed colour of a pixel as a combination of foreground and background colours. Pixels with an opacity value of $\alpha = 1$ are considered to be in the foreground, while those with a value of $\alpha = 0$ are considered to be in the background.

II. RELATED WORK

Colour Separation Overlay is a common method used in visual effects and picture editing.

The input image is generally divided into the foreground, background, and regions with undetermined contrast using a trimap. A variety of image processing techniques, including deblurring [2], soft colour segmentation [3, 4], reflection removal [5], and green-screen keying [1], make use of opacity estimation in images.

The colour statistics of the known foreground and background are built via sampling in sampling-based algorithms [6,7], and the matte in the 'unknown' region is then solved. Propagation-based techniques [8,9,10] seek to resolve the matting equation by propagating the alpha matte from the foreground and background regions into the 'unknown' region.

III. SYSTEM DESIGN

A. System Block Diagram

In the proposed project, we have built software that will use the concept of Colour Separation Overlay that is with the help of CNN.

CNN which helps them in finding patterns in images and videos allows the CNN algorithm

To suppress the background and input given by the users.

For this project the requirements are

- HARDWAREREQUIREMENTS:
  1. SYSTEM PROCESSORS: 5
  2. SPEED: 2.4GHz
  3. HARD DISK: 500GB
- SOFTWARE REQUIREMENTS:
  1. OPERATING SYSTEM:64Bit Windows
  2. LANGUAGE USED: Python
  3. IDE: Google Colab

IV. SYSTEM FLOW CHART

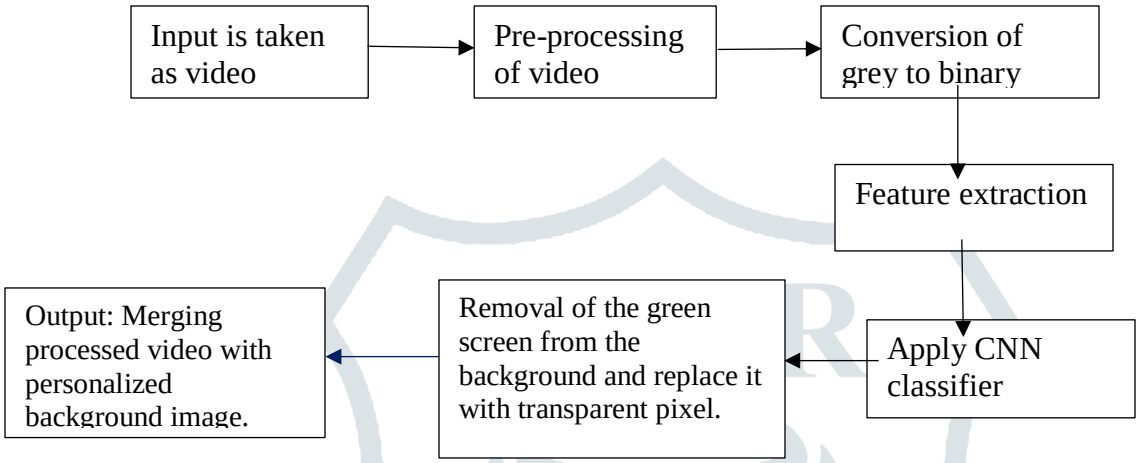

Fig. 1. System Flow Chart Colour Separation Overlay using CNN Model

Colour Separation Overlay which uses CNN helps in finding patterns in images to recognize objects, classesandcategories. In the proposed project we give images/videos as Input to the software/code which converts the given input into greyscale (The main reason why grayscale representations are often used for extracting descriptors instead of operating on colour images directly is that grayscale simplifies the algorithm and reduces computational requirements). Then feature extraction takes place that is in this is the process of transforming raw data into numerical features that can be processed while preserving the informationintheoriginaldataset.CNN is a neural network: an algorithm used to recognize patterns in data is used to recognize patterns and will remove the green screen from the background of the input image/video and replace it with transparent pixels, after that, we can upload any background in place of our original background(Green Screen).

With the help of this proposed project users can easily edit their images/videos as per their requirements.

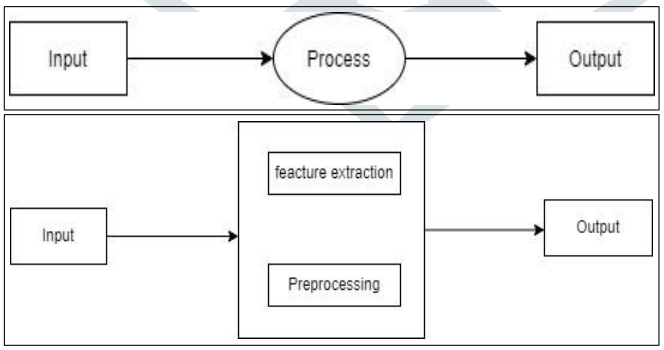

Fig. 2. System Flow Chart Colour Separation Overlay using CNN Model

IV. RESULT

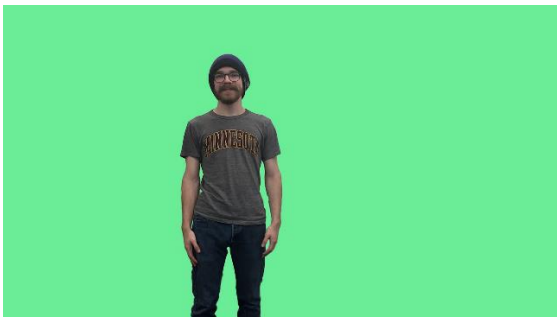
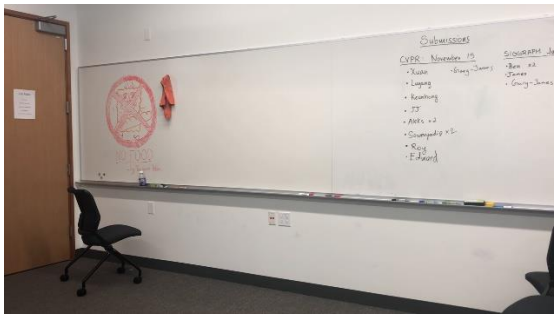

Fig. 4: Input

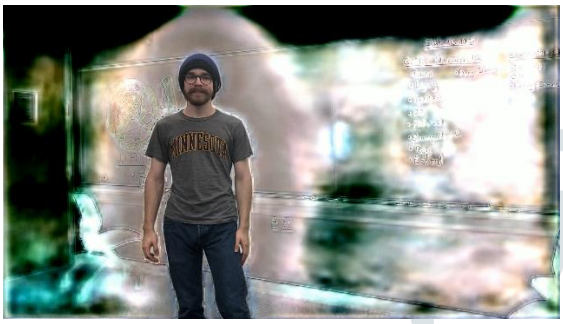
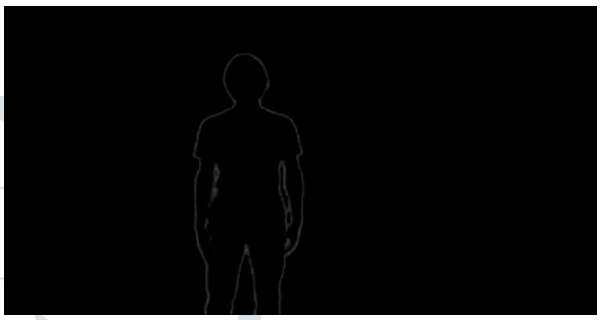

Fig 5:processing

Fig 6 : output

V.CONCLUSION

Colour Separation Overlay or Green Screen is at the centre of almost every Image, Video and Movie which we see in everyday life. The main important takeaway is that the editing can be done from anywhere. This saves the time and money of the user as they don't have to travel to far places for pictures, they can use Colour Separation Overlay or Green Screen and replace the background as per their needs. During the Covid -19 times, there were travel restrictions at that time every media group or film producer used Colour Separation Overlay or Green Screen for their movies film. As a Colour Separation Overlay or Green Screen technology consumer and developer, we must know about both the merits and the challenges associated with the adoption of Colour Separation Overlay or Green Screen.

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