Dynamic Time-lapse Video Generation via Single Still Image

- TEAM 1

Team members

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Introduction

- Time-lapse videos are typically created by using a fixed or slowly moving camera to capture an outdoor scene at a large frame interval.
- This unique kind of videos is visually appealing since it often presents drastic color tone changes and fast motions, which show the passage of time.
- But timelapse videos usually require a sophisticated hardware setup and are time-consuming to capture and edit.
- Therefore, it is desirable and helpful to design and develop a system to facilitate the creation of time-lapse videos.

Problem Description

- The appearance of an outdoor scene depends on many complicated factors including weather, season, time of day, and objects in the scene. As a result, most timelapse videos present highly nonlinear changes in both the temporal and spatial domains, and it is difficult to derive an explicit model to synthesize realistic time-lapse videos while taking all the deciding factors into account accurately.

Solution Approach & Methodology

- Procure time-lapse videos of different scenes.
- Study and store the features of the videos frame by frame
- Get the image of the subject whose Time lapse is required to be hallucinated.
- Transfer the effect from the frames to the given query image frame by frame.
- Collate the frames together to make timelapse hallucinated video

Module Overview

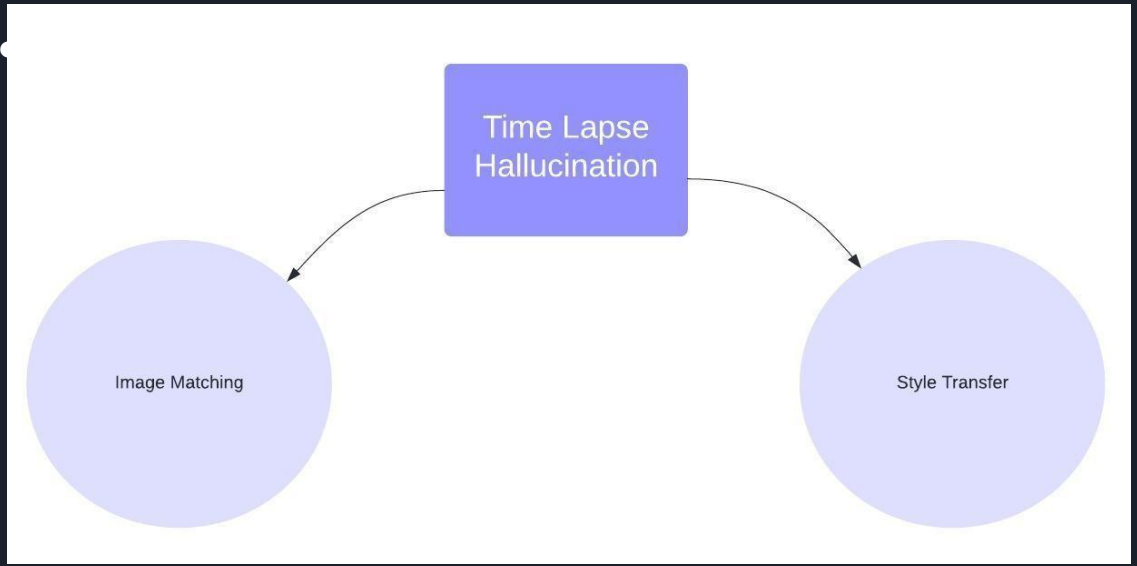


Image Matching - Method I

- Divides the image into five segments, namely
  - Top left
  - Top Right
  - Bottom left
  - Bottom Right
- Study the histogram of these individual segments
- Store the segments into a CSV file.

Image Matching - Method I (contd)

- Now for any input image study create the histogram in the same way.
- Create a feature vector for the input image
- Use the feature vector and to find its closest neighbor in the CSV file
- Get the video name of the matched frame in the CSV file.

Image Matching - Method II

- This method uses the "*Bag of Visual Words*" technique to select that video which has most features matched with the query image
- This method represents the image as a set of features
- We use keypoints and descriptors to construct vocabularies and represent each image as a frequency histogram of features that are in image
- From the frequency histogram, later, we can find another similar images or predict the category of the image

Results of Method-II

Query Image

Matched image

Results of Method-II

Query Image

Matched image

Style Transfer

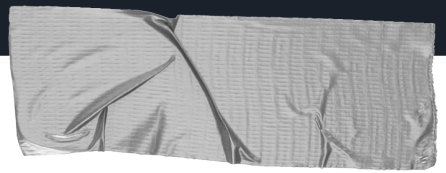
- Style transfer shall be tried to be done by transferring the relative distribution of individual color components from the source image to the target image to obtain the styled image.
- The mean of individual color channels of the target image is separated from the target image.
- Then the standard deviation ratio is used to scale down the image color channel reading.
- And finally the source mean is added to the target channels.

Query Image

Output video generator

Query Image

Output Video



Thank you