First Order Motion Model for Image Animation

Application of Data Science - Project Proposal Presentation Group F

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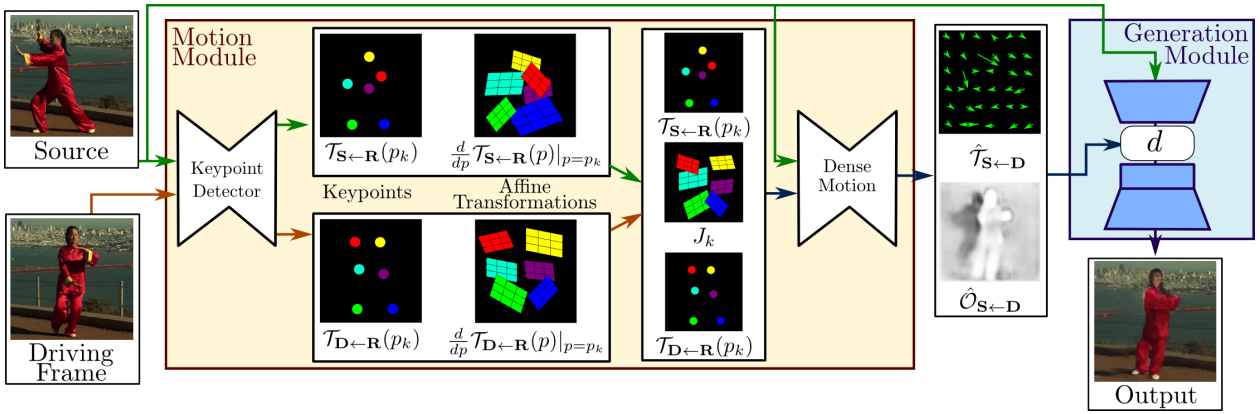
Introduction

Name of the Paper: First Order Motion Model for Image Animation
Authors: Aliaksandr Siarohin, Stéphane Lathuilière , Sergey Tulyakov, Elisa Ricci, Nicu Sebe

- This is an example of a deep fake or simply a type of artificial intelligence which can be used to produce convincing images, videos, audios, GIFs, aging, face swapping, etc.
- The above-mentioned paper was published in a latest prestigious conference - The Conference on Neural Information Processing Systems(NeurIPS) in December 2019.
- Deep fake is a trending topic these days which makes it a good candidate for us to replicate a paper in this domain.

How it Works?



- Recognises keypoints in both the source image and the driving video and encodes motion as keypoint-pairs displacement and local affine transformations.
- A dense motion network combines neighbouring transformations to obtain a dense motion field.
- In addition, this network outputs an occlusion mask to identify which parts of the driving video can be reconstructed by warping of source image.
- This occusion mask and motion field are combined using a generator network to output the final video.

Datasets and Code Implementation

- Can use a few of the following datasets: Taichi, Mgif, Fashion and Nemo available in the GitHub repository along with the paper
- To run these datasets on the code, the python script is available to download and preprocess them directly from GitHub and YouTube
- The project is implemented in python and is available in GitHub repository along with the paper
- The results could be reproduced using platforms like Google Colab or Pycharm

Original Data Sources

During the testing period we apply our model to the source image and each frame of the driving video and perform animation of the source image. There are two ways for performing image animation

- absolute keypoint locations
- relative keypoint locations

In our paper the datasets used are obtained from multiple websites and the data is resized . The data is in png form for better performance and reduce loss.

- We will be extracting data for multiple resources such as Kaggle, facebook deepfake challenge datasets and try to reproduce similar results obtained in the paper.
- Dataset can also be manually obtained from various websites from browser.
- The source image can be our own face for example which needs to be resized to be able to pair with any driving videos with similar object category.