Deep Learning and its Applications Project Presentation on Coloring Black And White movies Using Style Transfer Group-16

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Problem Statement

Neural style transfer is one of the most fascinating and interesting application of Deep Learning. With the help of this neural style transfer we are going to color black and white videos.
Let's say we have a very old Bollywood movie in black and white and we have a latest Bollywood coloured movie. Now using this colored movie we are going to color our old black and white movie and obtain a coloured version of that old movie.

Motivation and Challenges

Nowadays many people want to enjoy old movies and games, but because of their old color contrast and shady black and white color people avoid watching them. This might be the reason behind all this remakes coming nowadays. Using neural style transfer we can provide new life to all this old movies. Also it can provide a new look to many modern games and videos and can boast today's entertainment industry.

Neural style transfer seems to be very attractive and fascinating but implementing this network can be bit challenging in various aspects.

1) Style transfer is used to redefine images and small clips with few objects involved at a time in each frame but the most challenging part of this project is to apply style transfer to a movie with lots of objects involved at a time in each frame.

2) Other problems involved are whether all the objects are getting appropriate color, our network is able to distinguish between variety of objects, etc.

3) Problems related to network may occur at the time of implementation.

Dealing with all this problems will be challenging part for us.

Work Done

The current scenario of the work done is as follows:
1) We are trying to collect and read as many papers related to style transfer as possible so that we can get essence of it.
2) Basic understanding of CycleGAN, TextureGAN and related stuff.
3) Reading and understanding blogs like Turning Fortnite into PUBG with Deep Learning (using CycleGAN).
4) Also we are following prof.Andrew Ng tutorial on style transfer.

Data sets

Figure: A pic from Mughal-e-Azam

This black and white image from Mughal-e-Azam is transformed into a coloured image using style transfer.

Proposed Methodology

The steps or let's say methodology in which are thinking of proceeding are as follows:
1) Dividing the input video and the style video into numerous frames.
2) Learning and setting up neural network f:X $\rightarrow Y$,
which will transform the frames data sets from X domain (Black White) to Y domain (colored).
3) Learning another network f: Y$\rightarrow X$,
which is the exact reverse of the above network.
4) Computing the cycle loss and training the model with appropriate data set.
5) Discriminator network decides whether the frame is transformed or whether it is original in particular domain.

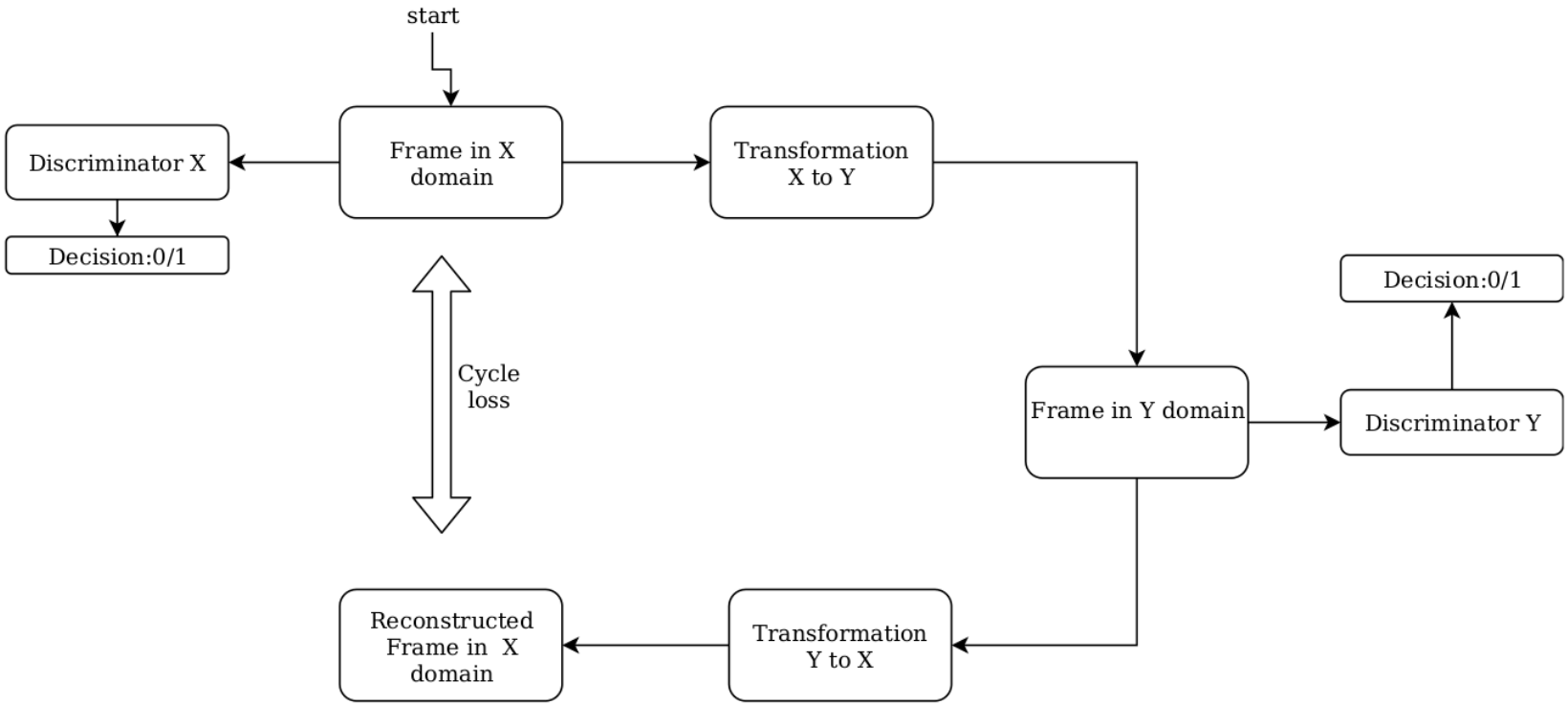

Figure: Block diagram of network