NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

**School of Computer Science and Engineering**
College of Engineering

Video Interpolation for Old Films

Old film restoration with the use of video frame interpolation

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Project Objectives:

The project aims to investigate the problem of old film restoration, which involves two main tasks: synthesizing intermediate frames and restoring their quality. Our goal is to increase the frame rate of the old films while simultaneously improving their visual quality through various enhancement modules.
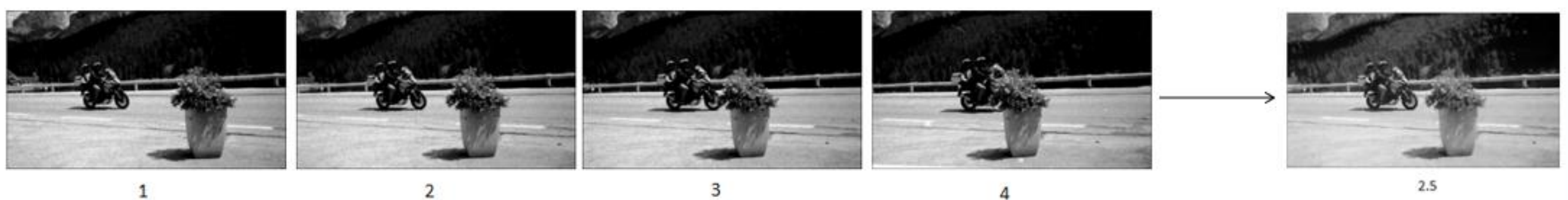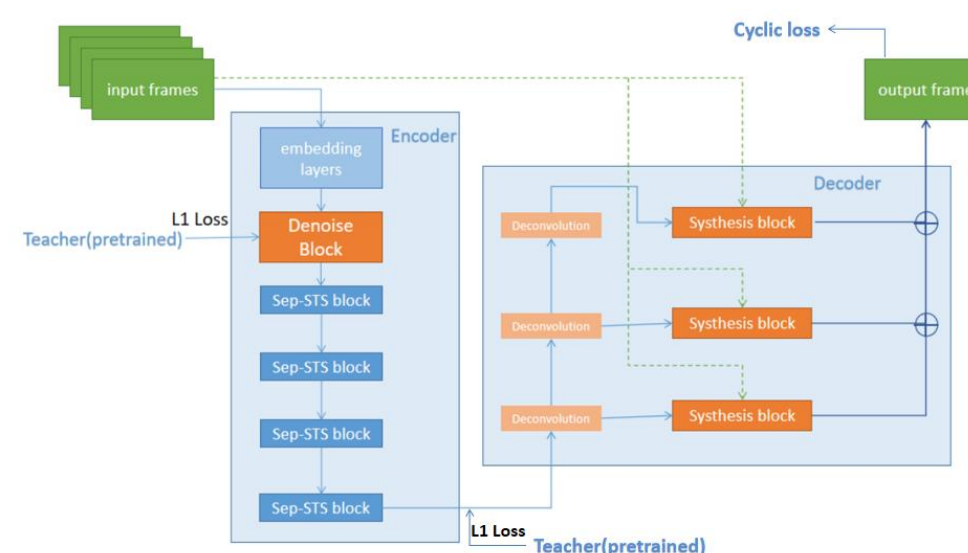

Video degradation:

The dataset is adopted from DAVIS dataset, and video degradation is performed to mimic old films.
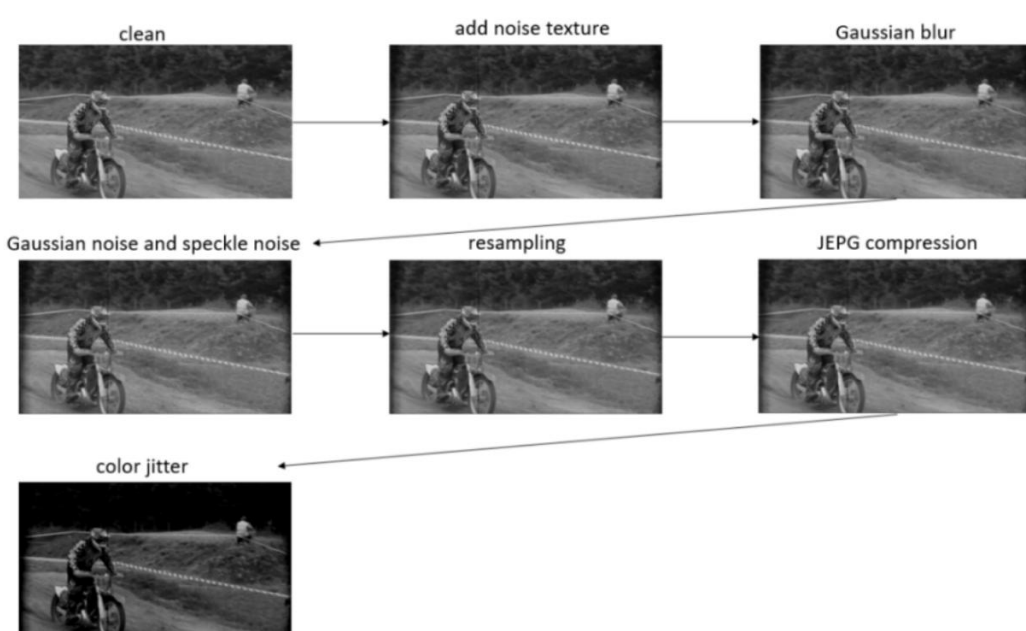
Model:

We adopted an existing model VFIT_B from "Video Frame Interpolation Transformer". Then three improvements are experiemented, which includes a teacher module, a denoise module and cyclic loss.

Experiment results:

index	teacher module	denoise module	cyclic loss	PSNR	SSIM
1	no	no	no	20.18	0.5771
2	yes(0.1*L1)	no	no	21.54	0.6090
3	yes(0.2*L1)	yes(0.01*L1)	no	21.87	0.6286
4	yes(0.2*L1)	yes(0.01*L1)	yes(0.01*L1)	21.72	0.6220

The best result came from experiment 3. It is the model trained with teacher and added with denoise module, and it has a PSNR of 21.87 and SSIM of 0.6286. The addition of cyclic loss didn't bring better performance.