RBPGAN:RECURRENT BACK-PROJECTION GENERATIVE ADVERSARIAL NETWORK FOR VIDEO SUPER RESOLUTION

Anonymous authors
Paper under double-blind review

ABSTRACT

In this paper, we propose a new Recurrent Back-Projection Generative Adversarial Network (RBPGAN) for Video Super Resolution in an attempt to generate videos that are temporally coherent, spatially detailed, and match human perception. To achieve this, RBPGAN is based on two state-of-the-art models: RBPN (Haris et al., 2019) which exceeds other models for producing very high-quality frames, and TecoGAN (Chu et al., 2020) which outperforms others in terms of temporal consistency. The generator of the model uses a reduced recurrent back-projection network that takes a set of neighboring frames and a target frame, applies SISR (Single Image Super Resolution) on each frame, and applies MISR (Multiple Image Super Resolution) through an encoder-decoder Back-Projection based approach to concatenate them and produce x4 resolution version of the target frame. The Spatio-temporal discriminator uses triplets of frames and penalizes the generator to generate the desired results. Our contribution results in a model that outperforms earlier work in terms of perceptual similarity and natural flow of frames, while maintaining temporal coherence and high-quality spatial details.

REFERENCES

Mengyu Chu, You Xie, Jonas Mayer, Laura Leal-Taixé, and Nils Thuerey. Learning temporal coherence via self-supervision for gan-based video generation. *ACM Transactions on Graphics (TOG)*, 39(4):75–1, 2020.

Muhammad Haris, Gregory Shakhnarovich, and Norimichi Ukita. Recurrent back-projection network for video super-resolution. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, pp. 3897–3906, 2019.