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INTRODUCTION

The technique to apply the style of an image to a target image while preserving the content of the target image is called Neural Style Transfer(NST).
NST was first published in a paper titled “A Neural Algorithm of Artistic Style”.’

SUMMARY OF APPROACH

1. Import a pre trained model . I have used VGG19 . VGG19 is CNN trained on more than a million images from Imagenet database and classify images into 1000 categories.
2. Intermediate layers of this model acts as feature extractor.
3. On comparing output of this network with content and generated image results in content cost.
4. On comparing output of this network with style and generated image results in style cost.
5. Total cost is a weighted submission of Style and Content cost.
6. We can then minimize this cost while updating the stylised image(Generated Image).

OBSERVATIONS

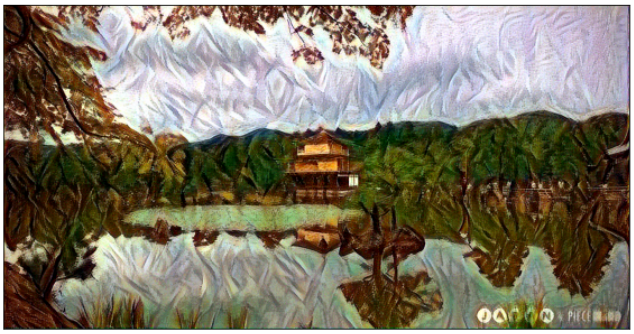
Number of Style Layers	Alpha	Beta	Number of iterations	Learning Rate	Index
3	10	20	20	7	1
3	20	10	20	7	2
3	10	20	20	10	3
3	20	10	20	10	4
5	20	10	20	7	5

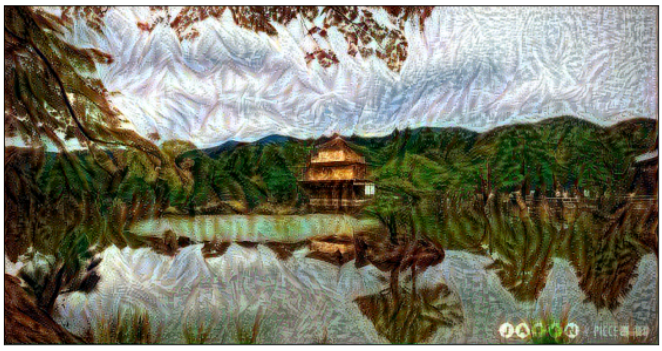
5	10	20	20	7	6
5	10	20	20	10	7
5	20	10	20	10	8

LEARNINGS

1. Neural Style Transfer is an approach to apply style of a “Style Image” to contents of “Content Image” resulting in a stylised image having style of former and content of later.
2. tf.GradientTape is an API for automatic differentiation. It can be used to compute the gradient of computation with respect to some inputs.
3. Gram Matrix is a more reliable metric when we want to match feature correlation rather than presence of a specific feature.

Stylised Images: clockwise from top-left 1-8.for different parameters.








Final Stylised Image