Image Style Transfer

*tl;dr: take the style of one image and apply it to the content of another. Don’t like neural networks? Maybe this project is for you!*

The “state-of-the-art,” while very much up to one’s artistic license, uses moment matching in deep convolutional neural networks [1]. There are several other approaches, though:

- patch-based style transfer [3]: the gist of this method is to transfer style and color by finding and applying a patch in the source image that matches a patch in the target image. The trick is to use local image features to determine the best scale of a patch (e.g., image gradients). The proposed algorithm produces decent results but one might notice that it does not transfer edge styles and misses out on the “semantics” of a style. Perhaps you could try
  - using superpixel-based patches instead of squares (and making this not slow),
  - performing patch transfer at multiple scales (think pyramids)
  - finding a patch similarity metric that corresponds well to human perception

- texture synthesis [1]: a significantly beefed (or vegetabled, if that’s more your style) up version of the previous patch-based algorithm. The results are more varied than before and may be considered to be more “visually appealing.”

- If you read the neural style transfer paper, you’ll notice that the algorithm does not preserve color! The author has a follow-up work on augmenting the algorithm to perform color mapping color mapping [5]. The results are promising but maybe you can improve on them by applying approaches in [2] or devising one of your own!

References


