

Typographic Design Generation Using Neural Style Transfer

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論 文 内 容 の 要 旨

Designing font and logo images requires a great deal of time and effort. Specifically, drawing, composing, and editing skills are necessary for logo design. Although several automatic logo-creating services are available now, they use heuristic or genetic algorithms, and, therefore, the risk of generating similar logos is high. For font design, typographic skills are essential in addition to the skills above. Moreover, each letter has to be designed individually. Recently, Neural Style Transfer is proposed for transferring styles from one image to another in order to generate a new stylized image. It uses Convolutional Neural Networks for comparing the input images. In this paper I will introduce two methods for automatically generating font and logo images based on the Neural Style Transfer. The first method produces new and unique font and logo images by stylizing ordinary shapes with machine learning. Specifically, I complement the Neural Style Transfer with a distance transform module and a patch matching module. The distance transform module is employed for constraining the styles inside the structure of the content image. The patch matching module ensures that no style information is lost during the style transfer process. I showed that the proposed method is superior to current style transfer methods for logo generation tasks with extensive experiments. The second method defines a font style difference using Convolutional Neural Network. The neural difference of styles between a pair of fonts is captured and transferred to another pair of fonts. One of the font images in the second pair is iteratively optimized to equalize the style differences of pair fonts. Experimentally, I was able to transfer the font style difference to another font pair. Novel fonts are generated by adding or removing font styles.