

Neural Style Transfer for Light Fields

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University of Dublin, Trinity College, 2020

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Style transfer involves combining the style of one image with the content of another to form a new image. Unlike traditional two-dimensional images which only capture the spatial intensity of light rays, four-dimensional light fields also capture the angular direction of the light rays. Stylizing a light field requires us to not only render convincing style transfer for each sub-aperture image, but also to preserve the angular structure of the light field. The naïve approach to stylizing a light field is to simply stylize each sub-aperture image independently. Unsurprisingly, doing so will destroy the light field's angular structure. We present our new method for light field style transfer which significantly outperforms this naïve approach. It uses our new initialisation method and angular loss function for the image-optimisation process to preserve the angular structure of the light field. We also present an architecture for a depth-aware approach to light field style transfer which uses a depth loss function to preserve the angular structure of the light field during the stylization process.