

Style Transfer for Interactive 3D Environments

by

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Abstract:

After over 40 years of development on computer graphics, many problems of generating photorealistic images by computer have been solved. In the early 1990s, some researchers turned to a new area called Non-Photorealistic Rendering, which focuses on creating digital art with a wide variety of artist styles, such as painting, and cartoon.

With so many NPR techniques available for various works at stylisation, we begin to think about not only rendering a scene in a random style, but also transferring styles. In the field of computer vision and 3D rendering, style transfer generally refers to the transfer of characteristics from one image or 3D scene to another. The common characteristics include colours, shapes, textures, brush-strokes, painting media, etc. An ideal style transfer process could be used in 3D modelling to decrease the amount of manual authoring work developing specific assets for 3D models. It could also help to blend a 3D virtual scene and a stylised background together in a coherent style in a film.

This paper investigates the current states of style transfer especially that applies the artistic style of an image onto a target 3D scene. It verified the possibility of transferring colours of a style image onto the textures of 3D objects based on their positions, and the integration of watercolour rendering after transferring colours. But many problems are still unsolved if we move onto transferring style-specific features.