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Skin color correction via convolutional neural networks in 3D fringe projection profilometry
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Abstract
Fringe Projection Profilometry (FPP) with Digital Light Projector technology is one of the most reliable 3D sensing techniques for biomedical applications. However, besides the fringe pattern images,often a color texture image is needed for an accurate medical documentation. This image may be acquired either by projecting a white image or a black image and relying on ambient light. Color Constancy is essential for a faithful digital record, although the optical properties of biological tissue make color reproducibility challenging. Furthermore, color perception is highly dependent on the illuminant. Here, we describe a deep learning-based method for skin color correction in FPP. We trained a convolutional neural network using a skin tone color palette acquired under different illumination conditions to learn the mapping relationship between the input color image and its counterpart in the sRGB color space. Preliminary experimental results demonstrate the potential for this approach. © COPYRIGHT SPIE. Downloading of the abstract is permitted for personal use only.

Index Keywords
Color computer graphics, Color image processing, Color vision, Colorimetry, Convolution, Convolutional neural networks, Deep learning, Medical applications, Medical imaging, Profilometry, Textures; 3-D sensing, Biomedical applications, Colour constancy, Convolutional neural network, Fringe pattern, Fringe projection profilometry, Image color processing., Pattern images, Sensing techniques, Skin color corrections; Color

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