

Transforming Standard RGB Images in 3D Digital Phantoms for Monte Carlo Simulations

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In recent years, there has been a growing use of imaging systems to assess optical and physiological properties in the fields of biomedicine and agriculture. These systems offer precision and sensitivity to measure the main chromophores and fluorophores of biological and agricultural content. Additionally, they also provide non-invasiveness and fast measurements, which are sometimes compatible with real-time applications. Typically, the images acquired by these optical techniques are not corrected for the curvature and other geometrical conformations of the sample. This study aims to apply artificial intelligence and digital image processing to go from a standard RGB image to a tridimensional phantom that can be used for Monte Carlo simulations. With Monte Carlo, the samples can be simulated in order to calculate correction considerations to the acquired images. Ideally, these corrections can be applied in any imaging technique capable of acquiring RGB images, or an additional image can be acquired in order to estimate the tridimensional digital phantom.

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