In silico tomographic image generation using Monte Carlo and Computational Geometry

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Abstract

Image simulation is an emerging field since the produced images have specific characteristics that may reflect special and/or rare cases regarding either the patient or the imaging modality.We have developed a method where the organ under examination can be reconstructed in the 3D space from real tomographic images, embed a simulated tumor inside the object, and subsequently generate the new tomographic images of the modulated organ. These images represent the organ with the embedded tumor having specific imaging characteristics, size and position. Thus, they can be used for systematic training and evaluation of doctors and computer systems dedicated to image reading and understanding.