

X ray scattering correction in Cone Beam Computed Tomography (CBCT)

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Advanced x-ray imaging systems typically use a divergent cone-beam source (Cone-beam computed tomography (CBCT)) and a large-area detector. Due to the physics of x-ray interaction with the imaged object, the size increase of x-ray illumination inevitably results in a boost of x-ray scatter signals on the projection images. In the current standard CT reconstruction theory, we reconstruct the image from its straight-line integrals. Primary signals are considered as “true signals” which contain useful information, while scatter signals cause measurement errors and greatly degrade the image quality. The primary objective of the PhD project is to develop a new scatter correction technique using Monte Carlo (MC) simulation boasting the time required in MC simulations with the use of a GPU and variance reduction techniques.