

Computed tomography (CT) has been employed as a versatile visualization tool in a wide variety of applications to human and small animal imaging, industrial non-destructive detection, material research, and security scan. The fast-imaging capability and superior spatial/contrast resolution offered by modern CT result in tremendous opportunities for developing additional applications and imaging protocols. In the last few years or so, there have been unprecedented breakthroughs in the development of innovative cone-beam imaging algorithms for obtaining volumetric images in cone-beam CT. In this presentation, I will discuss the algorithm advances in cone-beam CT in the last few years. Emphasis will be placed on targeted imaging of region of interest (ROI) and on image reconstruction from incomplete data in CT. Examples will be used to illustrate that the current and potential applications promised by the new development of CT algorithms. Finally, I will briefly use examples to illustrate that, although the algorithms to be discussed were developed for CT, they can readily be generalized to addressing image reconstruction problems in other imaging modalities, including MRI, nuclear medicine imaging, and phase-contrast CT.