Distributed x-ray source and imaging systems: promise and pitfalls

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Abstract: Since the first x-ray image produced by William Röntgen in 1895, almost all x-ray imaging systems are designed with a point x-ray source and 2D detectors. Cone shape x-ray beam geometry allows acquisition of a planar image with a single exposure, but it also has several drawbacks including excessive x-ray scattering, large detector dimension, etc. The emerging distributed x-ray source technology allows novel designs of x-ray imaging systems that may overcome the inherent problems of the current design. Our lab is developing linear array x-ray source and the Tetrahedron Beam CT (TBCT) with the linear source. TBCT may produce superior image quality with a compact geometry thanks to its scatter rejection geometry.

This presentation will provide an overview of the distributed x-ray source technologies developed by our lab as well as several academic and industrial groups. The promise and technical challenges of distributed x-ray source technology will be discussed.

Time: 8:30-9:30 a.m.
Date: Friday, Nov. 15, 2019
Room: 0120 Green Hall

Biography. Tiezhi Zhang is an assistant professor in the Radiation Oncology Department at the School of Medicine.