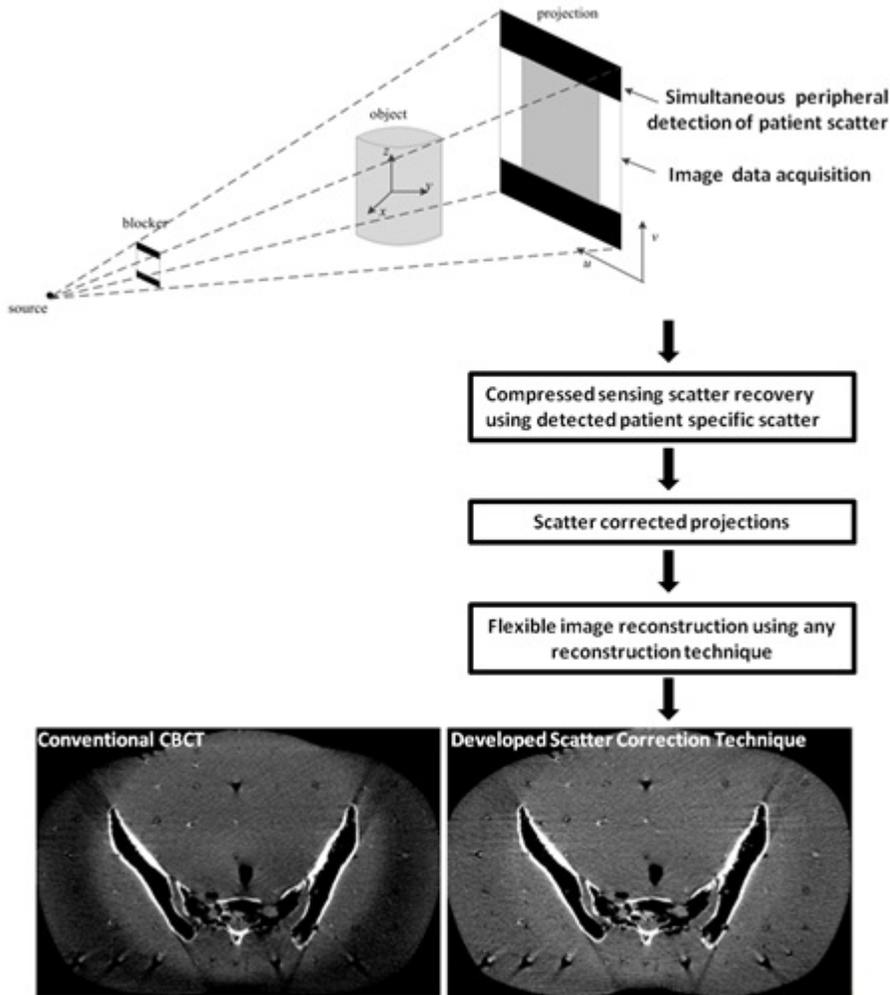


Improved CT Imaging Through Simultaneous Acquisition of Scatter and Image Projection Data

Researchers at Stanford University have developed a system for improved scatter correction in CT scans by simultaneously collecting image projection data and scatter data in a single scan. Subsequent to scanning, the scatter data can be used for patient specific scatter correction and reconstruction, improving the CT image quality, increasing contrast, fidelity and CT number accuracy. This system is readily adaptable to existing scanners and is applicable to a multitude of tomographic imaging modalities such as Cone-Beam CT, multi-detector row diagnostic CT, microCT, megavoltage CT, as well as modalities using a variety of different radiative sources and geometries.

The technique uniquely provides a method for patient specific scatter measurement without blocking the central field-of-view, and thereby allowing for unobstructed high quality image reconstruction. The peripheral scatter measurements, which are simultaneously acquired during the patient scan, are combined with a novel compressed sensing scatter retrieval algorithm to solve for and correct for the scatter throughout the projection space. As shown in the figure, the experimental results using a conventional CBCT scanner demonstrate that the method enables effective removal of scatter shading artifacts and significant improvement of CT number accuracy. Since the scatter corrected projections can be utilized by any desired reconstruction algorithm, the technique allows for a practical and flexible method of implementing robust patient specific scatter correction with most existing scanning systems.



Applications

- **Scatter correction** - effective for a multitude of computed tomographic imaging modalities in the medical, biological, and physical fields

Advantages

- **Patient-specific correction** - scatter correction is specific to the patient or object being scanned
- **Accurate and adaptive** - concurrent detection of tomographic image data and scatter data for scatter correction in tomographic reconstruction
- **Clearer images** - elimination of scatter artifacts results in higher contrast, image quality, and CT number accuracy

Patents

- Published Application: [20120207370](#)
- Issued: [8,989,469 \(USA\)](#)

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