A MULTI-STEP METHOD FOR MATERIAL DECOMPOSITION IN SPECTRAL COMPUTED TOMOGRAPHY

Summary
A multi-step algorithmic method that can significantly improve the image resolution and accuracy in Spectral Computed Tomography. The technique uses efficient image decomposition by grouping materials of similar properties in each step. This would allow decomposition of multiple composite materials with low X-ray exposure.

Competitive Advantages
- Improved resolution (55µm pixel size)
- Produces higher resolution at lower X-ray dose
- Improves photon economy by combining multi-energy data into fewer bins

Problem Addressed
- Currently used photo counting detectors have high image-noise with compromised contrast and accuracy.
- This is due to low photon concentration levels, low dose of imaging, presence of elements with similar properties and the spatial extent of these elements.

Applications
- X-Ray imaging in human tissue
- Kidney stone imaging
- Geoscience Imaging
- Petroleum industry—Rock compositions
- Defense and Security—Identify explosives

Meet the Inventor
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Research Interests:
- Spectral X-Ray Detection
- Phase Contrast X-Ray Imaging
- Tomographic breast imaging
- Combining Light-Radiation and Acoustics
- EM Wave Propagation Biological Tissue
- Understanding human perception
- Psychophysics, Image Perception and Pre-Clinical Optimization

Patents
- US 62/507,694

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