



## SYSTEMS AND METHODS FOR CONTROLLING PILEUP LOSSES IN COMPUTED TOMOGRAPHY

WARF: P230043US01

Inventors: Ke Li, Kevin Treb

### Overview

Photon counting detector CT (PCD-CT) has been featured as one of the most important advances in low dose CT imaging due to its powerful noise rejection functionality in addition to other advantages such as spectral CT imaging capability. PCD-CT is an emerging technology with the potential to improve clinical CT imaging dramatically. In PCD-CT, electric pulses induced by two or more x-ray photons can superimpose (i.e., pileup) when their temporal separation is less than the detector deadtime. Pulse pileups result in not only losses in the recorded counts, but also distortions of the x-ray energy information. Consequently, pulse pileups degrade the quantitative accuracy of both non-spectral and spectral PCD-CT images.

### The Invention

UW-Madison researchers have developed a system and method for producing accurate computed tomography (CT) medical images. X-rays pass through an object with a photon-counting detector system, which includes a plurality of detector pixels configured to generate a photon-counting signal in response to receiving each photon of the x-rays. The method also includes summing a charge associated with each photon received at a given detector pixel of the plurality of pixels to generate a charge integration signal, utilizing the charge integration signal to correct a count of the photon-counting signal for pileup-induced count losses to create a corrected photon counting signal, and reconstructing an image of the object using the corrected photon-counting signal.

### Additional Information

#### For More Information About the Inventors

- [Ke Li](#)

#### Tech Fields

- [Medical Imaging : CT](#)

For current licensing status, please contact Jeanine Burmania at [jeanine@warf.org](mailto:jeanine@warf.org) or 608-960-9846