Medical Imaging with Better Temporal Fidelity Can Streamline Stroke Care

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Technology description

The outcome of a stroke can hinge on the time spent on diagnosis and intervention. Perfusion imaging is a critical step in the process, wherein a patient is scanned to identify salvageable tissue. These perfusion studies can take hours to schedule and perform. Transporting patients between imaging and intervention suites is a race against time.

Health care could be streamlined if perfusion studies were performed with the same c-arm computed tomography (CT) system used for intervention. Two major challenges hinder this. First, these systems are too slow to accurately record ‘contrast dynamics,’ or factors that vary with time (such as an imaging agent injected in a subject). Also, the number of acquired time frames is too few to estimate perfusion information from time density curves.

Software that would enable the current hardware to perform perfusion imaging is highly desirable. UW–Madison researchers have developed a method that increases temporal fidelity, sampling density and/or reduces noise of image frames obtained with a system such as CT, MRI or X-ray c-arm. After the images are acquired, a window function is selected and temporally deconvolves the image frames using a minimization technique. A temporal sampling density also may be selected and used in the temporal deconvolution.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method that removes blurring caused by low temporal resolution and enables increased sampling density for contrast dynamics.

Application area

Perfusion imaging software

Advantages

Better imaging with higher temporal fidelity
Clearer depiction of time-varying image contrasts
Increased temporal sampling density and/or reduced temporal noise

No hardware modification

Institution

Wisconsin Alumni Research Foundation

Inventors

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