

Medical, scientific image analysis vastly improved by new software

January 24 2017, by Nathan Hurst

Many current medical and scientific practices involve the analysis of highly complicated images, such as magnetic resonance imaging (MRI) and nuclear magnetic resonance spectroscopy (NMR) in order to study medical problems for patients or biochemical processes for scientific research. Previously, doctors and scientists would have to spend hours, days or even weeks painstakingly analyzing these images. Now, researchers at the University of Missouri have developed new software that will analyze any series of images much faster and more accurately than ever before.

The new software, Tracking Equilibrium and Nonequilibrium shifts in Data (TREND), can quickly analyze any series of images, including MRI images, computerized tomography (CT) scans, ultrasound images, video images, and imaging from scientific equipment of all kinds. The TREND software will study sets of images to resolve and track the changes among the images. For example, a movie of a beating heart can be analyzed by TREND almost instantly to determine if any irregularities or potential health problems exist. Other applications include all kinds of biological, chemical or geographical changes. TREND can quickly analyze the videos to plot and resolve changes as well as reconstruct videos to focus only on the individual processes and changes of interest, such as just the heart beat without changes effected by breathing, or vice versa.

"TREND allows accurate, rapid analysis of incredibly complex and nuanced images, which can potentially save doctors, patients and

scientists countless hours and money," said Steve Van Doren, a professor in the MU Department of Biochemistry and co-developer of the software. "TREND has allowed us to advance our own research into enzyme interactions considerably. Previously, it would take us weeks to analyze a single group of [images](#). With TREND, that analysis now takes only a few minutes and is more accurate and consistent than if a human performed the work."

TREND was developed by Van Doren and Jia Xu, a research scientist in the MU Department of Biochemistry, which is housed in the College of Agriculture, Food and Natural Resources and the School of Medicine. The study outlining TREND, "Tracking Equilibrium and Nonequilibrium Shifts with TREND," was published in *Biophysical Journal* on Jan. 24.

More information: *Biophysical Journal*, [DOI: 10.1016/j.bpj.2016.12.018](#)

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