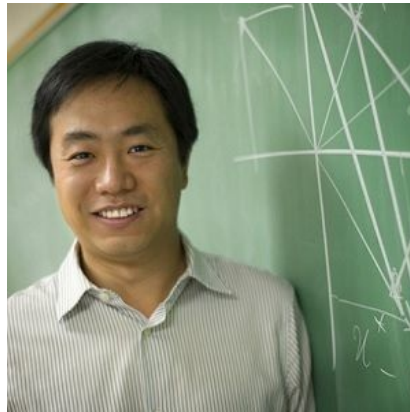




## More Precise Lung Cancer Imaging, Radiation Results



To improve precision of lung cancer imaging, researchers have developed a new technique that uses mathematical modelling to capture images of a patient's lung when it is depressed — the stage that offers the best picture of a cancerous site.

The new approach monitors respiratory gating, or a patient's motion breath-by-breath, and uses the data collected to focus a radiology beam on the targeted area when the chest cavity is relaxed. "Respiratory gating is a readily available technology, but it has been very slow to gain acceptance in managing respiratory motion in radiation therapy," says lead researcher Shouyi Wang, an assistant professor in the Department of Industrial, Manufacturing and Systems Engineering, University of Texas at Arlington.

Wang's work is supported by a three-year, \$250,000 National Science Foundation grant and promises to lead to improved, more precise radiation therapy. The goal is to create a personalised motion-management system that takes into account the diagnostic factors for an individual patient. Wang's team includes researchers from University of Washington.

"We will develop a powerful new mathematical model that considers different factors and takes into account all of the major variables, and predicts performance and the best method for a particular patient," Wang explains. The model will use data collected by UW and also will take into account physicians' experiences and prior knowledge.

Wang's collaborators at UW are the first to try making the best use of the computer-guided respiratory gating method, which has only recently come into practice.

The team describes how the personalised motion-management system works. The process is automated with a sensor on the patient's chest or abdomen that sends a signal to start or stop the common positron emission tomography and computed tomography (PET/CT) scan. The system allows more precise imaging, and eliminates the need for the chest to be compressed.

"Dr. Wang's research may provide relief to lung cancer patients as they undergo life-saving treatments, greatly reducing discomfort and allowing them to benefit from more effective imaging and therapy that will treat their disease," according to Khosrow Behbehani, dean of the UTA College of Engineering.

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