

Department of Mathematics

Applied Mathematics Seminar

The Mathematics of Medical Imaging: What is Essential Is Invisible to the Eyes

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Date: November 8, 2019

Time: 2-3 PM

Place: Allgood Hall E259

Abstract

Medical imaging began in 1895 when Wilhelm Roentgen took the first x-ray image of his wife's hand. Since Roentgen's discovery that electromagnetic waves could be used to see inside the human body, there have been many exciting discoveries in medical imaging, including how to image using many x-ray projections (CT scans), using sound (ultrasound), using magnetic spins (MRI), and more recently using near infrared light (optical tomography). Mathematics has been a partner in the development of these imaging techniques. Calculus, linear algebra, Fourier transforms, partial differential equations, scientific computing and statistical inference are only some of the mathematical and statistical tools which play an important role. This talk will give an overview of the past, present and future of medical imaging and its partnership with mathematics. Even though the talk will include some advanced mathematics, statistics and machine learning, it will be accessible to undergraduate students.