

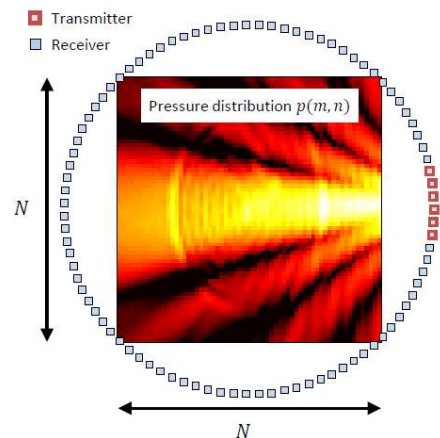


Ultrasound Tomography for Breast Cancer

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Ultrasound tomography (UST) is an imaging technique that combines sonography with computed tomography (CT) methods to solve an inverse problem. It is well suited for inferring biomechanical properties of a volume of tissue from measurements made along a surface surrounding the tissue. One clinically relevant application is the detection of breast cancer.

UST has been under development for more than 30 years, motivated by many potential advantages over x-ray CT in the area of medical imaging. At diagnostic levels, sound waves do not appreciably heat tissue and, unlike x-rays, do not damage tissue through the process of ionization. With mounting concerns over radiation exposure, UST offers a nonsignificant risk alternative for medical imaging. In the area of breast imaging, UST offers the possibility of a comfortable alternative to mammography, which requires substantial compression that many women find uncomfortable and some even painful. Furthermore, UST is poised to address limitations associated with current clinical breast imaging.



In this research project, we will develop a new recovery method for ultrasound tomography based on sparse regularizer. The work will involve studying the basics of ultrasound imaging and tomography, deriving new theory and implementing it in MATLAB simulations.

Required background:

Introduction to Digital Signal Processing (044198)

MATLAB

Optical Tomography - Advantage.

רוצים לדעת עוד? סרקו

