ELECTRICAL & COMPUTER ENGINEERING BIO-SEMINAR Fall 2019

ENGINEERING TEXAS A&M UNIVERSITY

When: **Friday 15:00 – 16:00, October 11, 2019**
Where: **ETB 1035**

Speaker: **Raffaella Righetti, Ph.D.**

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Department of Electrical and Computer Engineering
Texas A&M University

Title: **Non-invasive Assessment of the Mechanical Properties of Cancers using Ultrasound**

Abstract: The mechanical microenvironment plays a key role in tumor growth and aggressiveness, affects tumor invasion and metastasis and impacts the effectiveness of most cancer therapies. While in the past decade some progress has been made to develop methods that can map stiffness of cancers, non-invasive and quantitative assessment of the mechanical properties of cancers *in vivo* remains very challenging. Our laboratory has focused on the development, implementation and testing of novel ultrasonic methods to simultaneously image and quantify multiple mechanical and transport properties of cancers *in vivo*, non-invasively and with high spatial and temporal resolutions. In this talk, we specifically focus on our recently developed techniques to accurately assess mechanical properties of cancers based on the biphasic assumption of soft tissues. Unlike previously proposed methods retrievable in the literature, our proposed techniques are capable of imaging and quantifying mechanical properties of a tumor and surrounding tissue without any constraint on the compressibility of the tissues and are robust to changes in tumor's shape and boundary conditions. In the future, availability of these techniques in pre-clinical and clinical studies can help us understanding the overall role that mechanical properties have in driving cancer growth and provide a new means to guide and monitor treatments that can deliver effective and personalized care.

Bio: Raffaella Righetti received her Doctor of Electronics Engineering degree from the University of Florence (1999). She received a M.S. degree (2001) and a Ph.D. degree (2005) in Electrical Engineering from the University of Houston, for her work on ultrasound elastography in the Dept. of Diagnostic and Interventional Imaging at the University of Texas Health Science Center, Houston, TX. She then pursued her postdoctoral work at the University of Texas, Houston, TX. She is currently an Associate Professor in the Dept. of Electrical and Computer Engineering at Texas A&M University and an Associate Member of the Houston Methodist Research Institute, Houston, TX. She has served as a reviewer for the National Institute of Health, the National Science Foundation, the Department of Defense, the National Space Biomedical Research Institute (NASA) and the Italian Ministry of Health. Dr. Righetti's research interests include the development of new ultrasound-based imaging techniques and image-guided therapeutic ultrasound methods.