Department of Mathematics

Public Lecture

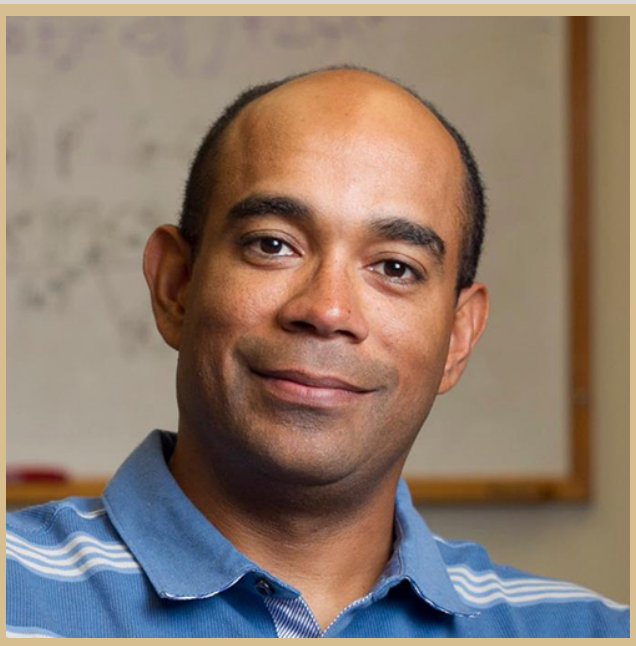
MATH IS KEY

Tuesday, April 19, 2022
3:30 p.m.
MATH 175

Refreshments to precede talk at 2:45 p.m. in the Mathematics Library Lounge.

Assessing Human Health Through Mechanics, Mathematics, and Computing

In this talk, we will learn about the relatively new area of Elastography in medical diagnosis. Mechanical waves, mathematics, and computing are the backbone of these novel non-invasive methods whose ultimate goal is the early diagnosis of some of the most challenging human illnesses: e.g. arterial disease, breast cancer, and liver disease. We will cover how mechanical waves can be remotely launched and tracked inside the human body using non-conventional ultrasound approaches. Mechanical waves provide information about tissue pathology that cannot be revealed by other conventional medical imaging modalities. We will study how to extract information from these waves using inverse problem techniques and how the ensuing solutions can help improve medical diagnosis and human health in general. The talk includes an intuitive overview of how differential equations, optimization, signal processing, and classifiers can play an important role in medical imaging and diagnosis.



Dr. Wilkins Aquino

Anderson-Rupp Professor of
Mechanical Engineering
and Materials Science
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Dr. Wilkins Aquino obtained a BSCE from Purdue University, and a MS and PhD in Civil Engineering from the University of Illinois at Urbana-Champaign. Before joining the Duke Faculty, he was an associate professor in the School of Civil and Environmental Engineering at Cornell University. He was also a member of the fields of Theoretical and Applied Mechanics and Applied Mathematics at Cornell.

Prof. Aquino has broad interests in computational mechanics, including finite element methods, computational inverse problems, uncertainty quantification, coupled chemo-mechanics, and computational acoustics, among others.

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