



MARQUETTE  
UNIVERSITY

HELEN WAY KLINGLER  
COLLEGE OF ARTS AND SCIENCES

Department of Mathematics, Statistics and Computer Science

## COLLOQUIUM

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### *Improving Image Quality for Practical Electrical Impedance Tomography Imaging with Direct D-bar Methods*

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**3:30 PM, Thursday, March 9, 2017**

Cudahy Hall, Room 401

#### **Abstract**

Thoracic Electrical Impedance Tomography (EIT) imaging recovers the internal conductivity and permittivity distributions of a patient's thorax from electrical measurements taken on electrodes attached to the patient's chest. The reconstruction task is a severely ill-posed nonlinear inverse problem that is highly sensitive to measurement noise and modeling errors. Over the past decade, D-bar methods have shown great promise in producing noise-robust implementable real-time imaging algorithms by employing a low-pass filter in a nonlinear Fourier domain. This talk focuses on recent advancements in D-bar methods for EIT imaging. In particular, how including spatial information known with high confidence (approximate organ locations and sizes in healthy patients) greatly improves EIT reconstructions while still allowing underlying pathologies to be visualized in sick patients. Furthermore, critically-ill patients can be imaged by only using the accessible part of their body (i.e. a partial boundary problem). Reconstructions from experimental data are presented and future directions discussed.

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For further information: see <http://www.marquette.edu/mscs/resources-colloquium.shtml>

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CUDAHY HALL, ROOM 342 AT 4:30 P.M.*