Fall 2016

Mathematical Sciences Seminar

"Electrical impedance tomography for pulmonary functional imaging: Methods and clinical results"

"Electrical impedance tomography (EIT) is a noninvasive, non-ionizing medical imaging technique in which the conductivity of the tissue in a region of interest is computed from measurements of the current density-to-voltage mapping on the surface. The reconstruction problem is a nonlinear ill-posed inverse problem. In this talk, a direct reconstruction method will be presented that is being used for pulmonary imaging on patients of Children's Hospital of Colorado with the ACE 1 EIT system. The direct D-bar method is a real-time 2-D reconstruction algorithm based on complex geometrical optics solutions and inverse scattering. In our study, EIT data is collected simultaneously with pulmonary function tests (PFTs), and regional and global measures of pulmonary function are computed from the images. These measures show strong correlation to the PFT output, and may provide additional clinical information in the future for diagnosis, monitoring, and treatment. The level of the presentation will be suitable for graduate students and those with a strong interest in applications.

Professor Jennifer Mueller

(Mathematics Department, Colorado State University)

Monday, October 17, 2016

Lally 104

Host: Dave Isaacson

Rensselaer