



QUICK LINKS:


- about
- people
 - faculty
 - recent publications
 - courses
 - staff
- research
- events
- contacts
- news
- bme home
- pratt home
- duke home

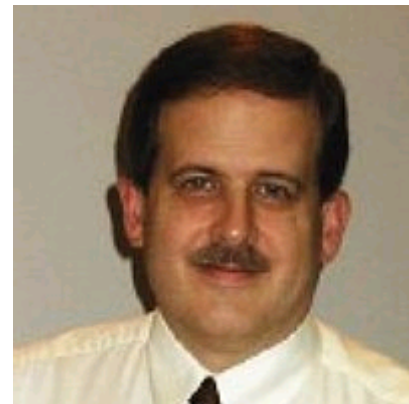
INFORMATION FOR:

- undergrads
- grads
- industry
- employment

JAMES T DOBBINS III, ASSOCIATE PROFESSOR OF RADIOLOGY, MEDICAL PHYSICS GRADUATE PROGRAM AND BIOMEDICAL ENGINEERING

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Education:

Ph.D., University of Wisconsin at Milwaukee, 1985
 PhD, 1985
 MS, 1983

Specialties:

Medical Imaging

Research Interests:

There are several research projects underway in my laboratory, focusing on the improvement of diagnostic accuracy in digital chest radiography and digital mammography. The first project uses a dual-energy digital radiography technique that forms images which have either the bones or soft-tissues canceled. By eliminating the ribs in the soft-tissue image, better accuracy in detecting nodules has been demonstrated in early clinical evaluations of the technique. The bone image is also useful in that it demonstrates whether a detected nodule is calcified, at a fraction of the cost and radiation exposure of sending the patient to CT. We have received six years of NIH grant funding to develop a practical screening method for nodular disease using the dual-energy technique. A second major area of research is digital tomosynthesis. This technique allows longitudinal slice images of a patient to be generated from a series of projection images taken at different angles. We are evaluating this technique for its potential to improve detection of pulmonary nodules. We have received seven years of NIH funding to develop and evaluate this technique. Preliminary evaluation in a pilot study using human subjects revealed that the detection rate for pulmonary nodules increased from about 22% to 70% in tomosynthesis slice images compared with conventional PA chest radiographs. Thus, the tomosynthesis technique would appear to hold promise as a method of improving both sensitivity and specificity of pulmonary nodule detection in vivo. We are also expanding this tomosynthesis work to evaluate its potential for improving detection of masses and calcifications in digital mammograms. Other projects include theoretical analysis of digital imaging performance and the measurement of image quality (DQE) in computed radiography and flat-panel systems.

Areas of Interest:

Advanced digital imaging applications
 Imaging devices for global health
 Image quality metrology

Current Ph.D. Students (Former Students)

➤ Christina M. Li

Postdocs Mentored

➤ Nariman Majdi-Nasab (2004 - 2006)
 ➤ Sean M Hames (1996 - 1998)

Selected Other

Founder and Director, Duke Medical Physics Graduate Program, 2002 - present [edu]
Co-founder and co-chair, Steering Committee for the Society of Directors of Academic Medical Physics Programs, 2007 - present
Co-chair, SPIE Physics of Medical Imaging Conference, 1998 - 2000
Chair, NIH Special Study Section 7, 1998, 1999
Associate Editor, Medical Physics journal, 1994 - 1998

Representative Publications (More Publications)

Dobbins, J.T. and Samei, E. and Ranger, N.T. and Ying Chen, *Intercomparison of methods for image quality characterization. II. Noise power spectrum*, Med. Phys. (USA), vol. 33 no. 5 (2006), pp. 1466 - 75 [1.2188819] [abs].
Godfrey, D.J. and McAdams, H.P. and Dobbins, J.T., III, *Optimization of the matrix inversion tomosynthesis (MITS) impulse response and modulation transfer function characteristics for chest imaging*, Med. Phys. (USA), vol. 33 no. 3 (2006), pp. 655 - 67 [1.2170398] [abs].
Dobbins, J.T., III and Godfrey, D.J., *Digital x-ray tomosynthesis: current state of the art and clinical potential*, Phys. Med. Biol. (UK), vol. 48 no. 19 (2003), pp. 65 - 106 [R01] [abs].
Warp, R.J. and Dobbins, J.T., III, *Quantitative evaluation of noise reduction strategies in dual-energy imaging*, Med. Phys. (USA), vol. 30 no. 2 (2003), pp. 190 - 8 [1.1538232] [abs].
Dobbins, J.T., III and Ergunb, D.L. and Rutz, L. and Hinshaw, D.A. and Blume, H. and Clark, D.C., *DQE(f) of four generations of computed radiography acquisition devices*, Med. Phys. (USA), vol. 22 no. 10 (1995), pp. 1581 - 93 [1.597627] [abs].

Selected Invited Lectures

Theoretical and practical elements of tomosynthesis imaging (invited workshop), 2007, SPIE Physics of Medical Imaging Conference
Imaging in Medicine: digital radiography (keynote address), 2006, SPIE Physics of Medical Imaging Conference
Digital radiography: technical foundations and contemporary research, 2005, Memphis BioImaging Symposium
Advances in digital radiography -- Digital radiographic advanced methods for depth discrimination: chest tomosynthesis, 2005, Radiological Society of North America 91st Scientific Assembly
Digital x-ray detectors for radiography: technical innovations (physics plenary talk), 1999, Radiological Society of North America 85th Scientific Assembly

Selected Grant Support

- » *Cross-disciplinary training in medical physics, National Institutes of Health, T32 EB007185.*
- » *Digital radiography research agreement with General Electric (continuation), GE Healthcare.*
- » *Tomosynthesis for improved pulmonary nodule detection (competing continuation), National Institutes of Health, R01 CA080490-04.*
- » *Digital radiography research agreement with General Electric, GE Healthcare.*
- » *Tomosynthesis for improved pulmonary nodule detection, National Institutes of Health, R01 CA080490-01.*
- » *Dual-energy screening for nodular disease (competing continuation), National Institutes of Health, R01 CA55388-04.*
- » *Dual-energy screening for nodular disease, National Institutes of Health, R01 CA55388-01.*
- » *Digital chest radiography with a digital beam attenuator, National Institutes of Health, R23 CA43854.*