

CURRICULUM VITAE

JOVAN G. BRANKOV

Office address

Department of Electrical and Computer Engineering
Medical Imaging Research Center
Illinois Institute of Technology
3440 S Dearborn, Suite 100
Chicago, IL 60616
Phone: (312) 567-8819
FAX: (312) 567-5986
e-mail: brankov@iit.edu
web: http://www.iit.edu/engineering/ece/faculty/brankov_jovan.shtml
<http://www.brankov.com>

EDUCATION

- **Diploma of Electrical Engineering**
University of Belgrade, Belgrade, Serbia, 1996.
- **M.S., Electrical Engineering**
Illinois Institute of Technology, Chicago, Illinois, 1999.
- **Ph.D., Electrical Engineering - with honors**
Illinois Institute of Technology, Chicago, Illinois, 2002.
Advisor: Miles N. Wernick, Ph.D.
Thesis title: "Mesh Modeling, Reconstruction and Spatio-Temporal Processing of Medical Images"

PROFESSIONAL HISTORY

- 1994 - 1995 **Research & Development**, ZIS 2 Company, Krusevac, Serbia
System designer, working on hardware and software design and development for i8051 based control unit. Job included hardware installation and troubleshooting.
- 1996 **Technical support**, Sova Racunari, Belgrade, Serbia
Assembling PC configurations, installing local area networks, technical support.
- 1997 - 1998 **Research & Development**, Progma, Krusevac, Serbia
System designer, developing automatic control units, hardware installation and troubleshooting.
- 1996 - 1998 **Research & Development**, TUF Co. Belgrade, Serbia
R&D for electronic scales and automatic control units. Developing methods for low-level signal measurement under wide temperature range; System design and development for i8051 and i8085 based

- control unit including both hardware (electronic and PCB) and software (assembler and C); Developing interface between PC and electric scale. Job included equipment installation and troubleshooting.
- 1997 - 1998 **Technical support**, “DS inzenjering,” Belgrade, Serbia.
Maintenance and troubleshooting for LIEBHERR mobile cranes.
- 1998 - 2002 **Research Assistant/Teaching Assistant**, Department of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, IL
Developing and testing new medical imaging techniques.
Grading and monitoring students’ performance.
- 2002 - 2004 **Senior Research Associate**, Department of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, IL
Conducting and helping to lead several NIH-sponsored research projects in the area of medical image processing, including four-dimensional image reconstruction for gated SPECT, new methods for synchrotron-based x-ray imaging. Supervising research assistants.
- 2004 - 2008 **Assistant Research Professor**, Department of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, IL
Led several NIH-sponsored research projects. Supervising research assistants and research associates.
- 2004 - 2008 **Consultant**, Advanced Research, Nuclear Medicine Group, Siemens Medical Solutions USA, Inc., Hoffman Estates, IL
Developing numerical models for image quality assessment based on a human-observer model.
- 2007 **Consultant**, Clinical Advisors (Network of Advisors), New York, NY
- 2007 - 2010 **Council Member** of Gerson Lehrman Group Inc., Austin, TX
- 2008 - present **Assistant Professor**, Department of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, Illinois
- 2010 - present **Director**, Advanced X-ray Imaging Laboratory (AXIL), Illinois Institute of Technology, Chicago, Illinois

HONORS AND AWARDS

- 1989 3rd prize on regional student competition in field of radio communications electronics
- 1991 One-year stipend from “Kemeny Zsigmond” foundation to study at Budapest University of Technology and Economics
- 1995 - 1994 Member of the team winning state competition in communications (Elektrijada 94 and Elektrijada 95)
- 1999 Young Investigator Support, Future Directions in Nuclear Medicine Physics and Engineering, Chicago, IL, USA
- 1999 Student Award, 1999 IEEE Medical Imaging Conference, Seattle, WA, USA
- 2000 Student Award, 2000 IEEE Medical Imaging Conference, Lyon, France

2002 Ph.D. degree with honors - Illinois Institute of Technology
 2005 Elevated to IEEE Senior Member
 2006 Institute of Physics (IOP) Select: Paper “A physical model of multiple-image radiography,” *Physics in Medicine and Biology*, vol. 51, pp. 221-236, 2006, was chosen by IOP editors for novelty, significance and potential impact on future research.

AREAS OF SPECIALIZATION

Medical imaging, image sequence processing, data mining, pattern recognition. Emphasis on reconstruction, restoration, analysis (e.g. motion tracking, segmentation), recognition, acquisition and retrieval of images, especially for biomedical applications.

Current Research Topics

- Image quality assessment based on a human-observer model
- 4D and 5D tomographic image reconstruction methods for medical image sequences
- Multiple-image radiography, a new phase-sensitive imaging method
- Monte Carlo simulation tools using graphical processing units (GPU)

PUBLICATIONS

Book chapters:

1. **J. G. Brankov** and A. Zysk, “Analyzer-based phase-contrast X-ray imaging” in *Emerging Imaging Technologies for Medicine*, Taylor Francis/CRC PressBook, 2012.

Journal Papers:

1. T. Marin, M. M. Kalayeh, F. M. Parages, and **J. G. Brankov**, “Numerical surrogate of a human observer for cardiac motion defect detection in SPECT imaging,” accepted with minor revision, *IEEE Transactions on Medical Imaging*, 2013.
2. **J. G. Brankov**, “Evaluation of channelized Hotelling observer with internal-noise model in a train-test paradigm for cardiac SPECT defect detection,” accepted with minor revisions, *Physics in Medicine and Biology*, 2013.
3. M. M. Kalayeh, T. Marin, and **J. G. Brankov**, “Generalization evaluation of machine learning numerical observers for image quality,” *IEEE Transactions on Nuclear Science*, vol. 60, no. 3, pp. 1609-1618, 2013.
4. A.M. Zysk, A.B. Garson, Q. Xu, E.M. Brey, W. Zhou, **J.G. Brankov**, M.N. Wernick, J.R. Kuszak, and M.A. Anastasio “Nondestructive volumetric imaging of tissue microstructure with benchtop x-ray phase-contrast tomography and critical point drying,” *Biomedical Optics Express*, Vol. 3, Issue 8, pp. 1924-1932, 2012.
5. A. M. Zysk, **J. G. Brankov**, M. N. Wernick and M. A. Anastasio, “Adaptation of a clustered lumpy background model for task-based image quality assessment in x-ray phase-contrast mammography” vol. 39, Issue 2, pg. 906-912, *Medical Physics*, 2012.
6. F. Massanes, M. Cadennes and **J. G. Brankov**, “Compute-unified device architecture implementation of a block-matching algorithm for multiple graphical processing unit cards,” vol. 20, no. 3, *Journal of Electronic Imaging*, 2011.

7. M. A. Anastasio, C.-Y. Chou, A. M. Zysk, and **J. G. Brankov**, "Analysis of ideal observer signal detectability in phase-contrast imaging employing linear shift-invariant optical systems," *Journal Optical Society of America A*, vol. 27, issue 12, pp. 2648-2659, 2010.
8. T. Marin and **J. G. Brankov**, "Deformable left-ventricle mesh model for motion-compensated filtering in cardiac gated SPECT," *Medical Physics*, vol. 37, Issue 10, 2010.
9. M. Jin, Y. Yang, X. Niu, T. Marin, **J. G. Brankov**, B. Feng, P. H. Pretorius, M. A. King, and M. N. Wernick, "Quantitative evaluation study of four-dimensional gated cardiac SPECT reconstruction," *Physics in Medicine and Biology*, vol. 54, pp. 5643-5659, 2009.
10. **J. G. Brankov**, Y. Yang, L. Wei, I. El Naqa, and M. N. Wernick, "Learning a nonlinear channelized observer for image quality assessment," *IEEE Transactions on Medical Imaging*, vol. 28, no. 7, pp. 991-999, 2009.
11. C.-Y. Chou, M. A. Anastasio, **J. G. Brankov**, M. N. Wernick, E. M. Brey, D. M. Connor, and Z. Zhong, "An extended diffraction enhanced imaging method for implementing multiple-image radiography," *Physics in Medicine and Biology*, vol. 52, pp. 1923-1945, 2007.
12. **J. G. Brankov**, M. N. Wernick, M. A. King, Y. Yang, and M. V. Narayanan, "Spatially-adaptive temporal smoothing for dynamic image sequences," *IEEE Transactions on Nuclear Science*, vol. 53, issue 5, part 1, pp. 2769-2777, 2006.
13. G. Khelashvili, **J. G. Brankov**, D. Chapman, Z. Zhong, Y. Yang, and M. N. Wernick, "A physical model of multiple-image radiography," *Physics in Medicine and Biology*, vol. 51, no. 2, pp. 221-236, 2006.
14. **J. G. Brankov**, M. N. Wernick, Y. Yang, J. Li, C. Muehleman, Z. Zhong and M. A. Anastasio, "A computed tomography implementation of multiple-image radiography," *Medical Physics*, vol. 33, no. 2, pp. 278-289, 2006.
15. C. Muehleman, J. Li, Z. Zhong, **J. G. Brankov**, and M. N. Wernick, "Multiple-image radiography for soft tissue," *Journal of Anatomy*, vol. 208, pp. 115-124, 2006.
16. **J. G. Brankov**, Y. Yang, and M. N. Wernick, "Spatio-temporal processing of gated SPECT images using deformable mesh modeling," *Medical Physics*, vol. 32, no. 9, pp. 2839-2849, 2005.
17. P. Dong, **J. G. Brankov**, N. P. Galatsanos, Y. Yang, and F. Davoine, "Digital watermarking robust to geometric distortions," *IEEE Transactions on Image Processing*, vol. 14, no.12, pp. 2140-2150, 2005.
18. C. Muehleman, J. Li, M. Wernick, **J. Brankov**, K. Kuettner, and Z. Zhong, "Yes, You Can See Cartilage With X-rays (Diffraction Enhanced Imaging for Cartilage and Bone)," *Journal of Musculoskeletal and Neuronal Interactions*, vol. 4, no. 4, pp. 369-370, 2004.
19. H. Stark and **J. G. Brankov**, "Estimating the standard deviation from extreme Gaussian values," *IEEE Signal Processing Letters*, vol. 11, no. 3, pp. 320-322, 2004.
20. **J. Brankov**, Y. Yang, and M. N. Wernick, "Tomographic image reconstruction based on a content-adaptive mesh model," *IEEE Transactions on Medical Imaging*, vol. 23, pp. 202-212, 2004.

21. M. N. Wernick, O. Wirjadi, D. Chapman, Z. Zhong, N. P. Galatsanos, Y. Yang, **J. G. Brankov**, O. Oltulu, M. A. Anastasio, and C. Muehleman, "Multiple-image radiography," *Physics in Medicine and Biology*, vol. 48, pp. 3875-3895, 2003.
22. Y. Yang, M. N. Wernick, and **J. G. Brankov**, "A fast algorithm for accurate content-adaptive mesh generation," *IEEE Transactions on Image Processing*, vol. 12, pp. 866-881, 2003.

Other peer-reviewed articles:

1. M. N. Wernick, Y. Yang, **J. G. Brankov**, G. Yourganov and S. C. Strother, "Machine Learning in Medical imaging," Invited Review Paper, *IEEE Signal Processing Magazine*, vol. 27, no. 4, pp. 25-38, 2010.

Average impact factor: 2.67 (2012)

h-index: 11 (Thomson Reuters); 15 (Google Scholar)

Average citations per publication: 24.20

Submitted journal papers (in review):

1. K. Majidi, J. Li, C. Muehleman, and **J. G. Brankov**, "Noise analysis and sampling strategies for analyzer-based phase contrast imaging," submitted to *IEEE Transactions on Medical Imaging*.

Full-length conference proceedings papers:

1. F. Massanes, **J. G. Brankov**, "A preliminary comparison of different methods for human reader performance estimation," *Proc. of SPIE Symp. Medical Imag.*, vol. ?? , 2013
2. Felipe M. Parages, J. Michael O'Connor, P. Hendrik Pretorius, **J. G. Brankov**, "A Naive-Bayes Numerical Surrogate for a Human Observer in Perfusion Detection and Localization in SPECT-MPI" *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. ??, 2013.
3. Oriol Caudevilla, Keivan Majidi, J. G Brankov "Comparison between different methods for parametric image estimation in analyzer-based phase contrast images," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. ??, 2013.
4. F. Massanes, **J. G. Brankov** "A graphical processing unit based tomographic projection operator calculation for a content adaptive mesh model," *Proc. of SPIE Symp. Medical Imag.*, vol. 8318, 2012.
5. J. M. O'Connor, P. H. Pretorius, R. Licho, S. Joffe, S. Mehurg, H. C. Gifford, **J. G. Brankov**, "Creation of an ensemble of simulated cardiac cases and a human observer study: tools for the development of a numerical observer for SPECT myocardial perfusion imaging," *Proc. of SPIE Symp. Medical Imag.*, vol. 8318 , 2012.
6. F. M. Parages, **J. G. Brankov**, "Detection of cardiac abnormalities from mri sequences by using a deformable mesh model," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. ??, 2012.

7. J. Michael O'Connor, H. C. Gifford, **J. G. Brankov**, and P. H. Pretorius, "Incorporating holistic search into a SPECT myocardial perfusion imaging numerical observer," *Proc. of SPIE Symp. Medical Imag.*, vol. 7966, 2011.
8. T. Marin, M. M. Kalayeh, P. H. Pretorius, M. N. Wernick, Y. Yang and **J. G. Brankov**, "Numerical observer for cardiac motion assessment using machine learning," *Proc. of SPIE Symp. Medical Imag.*, vol. 7966, 2011.
9. M. M. Kalayeh, T. Marin, P. H. Pretorius, M. N. Wernick, Y. Yang and **J. G. Brankov**, "Channelized relevance vector machine as a numerical observer for cardiac perfusion defect detection task," *Proc. of SPIE Symp. Medical Imag.*, vol. 7966, 2011.
10. F. Massanes and **J. G. Brankov**, "Motion perception in medical imaging," *Proc. of SPIE Symp. Medical Imag.*, vol. 7966, 2011.
11. **J. G. Brankov**, "Optimization of the internal noise models for channelized hotelling observer," *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 1788 – 1791, 2011.
12. F. Massanes Basi, **J. G. Brankov**, "GPU based calculation of a spect projection operator for content adaptive mesh model," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 2649 – 2652, 2011.
13. F. M. Parages, M. N. Wernick, T. S. Denney Jr., **J. G. Brankov**, "Estimation of myocardial strain from MRI image sequence using a deformable mesh model," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 3855 – 3857, 2011.
14. **J. G. Brankov**, "Comparison of the internal noise models for channelized hotelling observer," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 4369 – 4372, 2011.
15. **J. G. Brankov**, T. Marin, P. H. Pretorius, Y. Yang, and M. N. Wernick, "Numerical observer for cardiac motion quality assessment," *Proc. of SPIE Symp. Elect. Imag.*, vol. 7533, 2010.
16. T. Marin, M. N. Wernick, Y. Yang and **J. G. Brankov**, "4D reconstruction of cardiac gated SPECT images using a content-adaptive deformable mesh model," *Proc. of SPIE Symp. Medical Imag.*, vol. 7623, 2010.
17. **J. G. Brankov** and P.H. Pretorius, "Personalized numerical observer," *Proc. of SPIE Symp. Medical Imag.*, vol. 7627, 2010.
18. L. de Sisternes, A. M. Zysk, **J. G. Brankov**, and M. N. Wernick, "Development of a computational three-dimensional breast lesion model," *Proc. of SPIE Symp. Medical Imag.*, vol. 7622, 2010.
19. M. A. Anastasio, C-Y Chou, A. M. Zysk, **J. G. Brankov**, "Contributions to ideal observer SNRs in x-ray phase-contrast imaging," *Proc. of SPIE Symp. Medical Imag.*, vol. 7622, 2010.
20. T. Marin, M. N. Wernick, Y. Yang and **J. G. Brankov**, "Motion-compensated reconstruction of gated cardiac SPECT images using a deformable mesh model," *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 520-523, 2010.
21. T. Marin, P. H. Pretorius, Y. Yang, M. N. Wernick and **J. G. Brankov**, "Numerical observer for cardiac-motion," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 2352 – 2355, 2010.
22. P.H Pretorius, J. M. O'Connor, R. Licho, and **J. G. Brankov**, "Task based assessment of cardiac function in Monte Carlo simulated gated Tl-201 perfusion

- SPECT: A human observer study,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 2972 - 2976 2010.
23. T. Marin, M. N. Wernick, Y. Yang, and **J. G. Brankov**, “Motion-compensated post-processing of gated cardiac SPECT images,” *Proc. of SPIE Symp. Medical Imag.*, vol. 7259, 2009.
 24. A. M. Zysk, Q. Xu, L. de Sisternes, **J. G. Brankov**, M. N. Wernick, and M. A. Anastasio. “Optimization of Spectral Shape in X-ray Phase-Contrast Mammography,” *Proc. of SPIE Symp. Medical Imag.*, vol. 7258, 2009.
 25. H. C. Gifford, P. H. Pretorius, and **J. G. Brankov**, “Tests of Scanning Model Observers for Myocardial SPECT Imaging,” *Proc. of SPIE Symp. Medical Imag.*, vol. 7263, 2009.
 26. F. M. Parages, M. N. Wernick, T. S. Denney Jr., and **J. G. Brankov**, “Deformable Mesh Model of Cardiac Motion from Tagged MRI Data,” *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 213-216, 2009.
 27. T. Marin, M. N. Wernick, Y. Yang, and **J. G. Brankov**, “Motion-compensated temporal summation of cardiac gated SPECT images using a deformable mesh model,” *IEEE Ann. Int. Conf. EMBC*, pp. 3657-3660, 2009.
 28. X. He, K. Drukker, J. Brankov and E. Frey, “Three-class Classification for Binary Decision Making,” *Medical Phys.*, vol. 36, pp. 2777, 2009.
 29. J. Arjona, P. H. Pretorius, H. Gifford, and **J. G. Brankov**, “Generalization Performance Evaluation of the Internal Noise Models for CHO,” *IEEE Nucl. Sci. Symp. Conf. Rec.*, pp.- 2009.
 30. **J. G. Brankov**, F. M. Parages, M. N. Wernick, Y. Yang, and T. S. Denney, “Estimation of Myocardium Deformation by Simultaneous Use of Tagged and Untagged Gated Cardiac MRI,” *IEEE Nucl. Sci. Symp. Conf. Rec.*, pp. 2830-2833, 2009.
 31. B. Marendic, Y. Yang, M. King, M. N. Wernick, and **J. G. Brankov**, “Imaging in Sitting Position may reduce liver artifact in myocardium perfusion imaging,” *IEEE Nucl. Sci. Symp. Conf. Rec.*, pp. 3984-3987, 2009.
 32. J. Brankov, R. Delgado, Y. Yang, M. Jin, and M. Wernick, “Progress in mesh based spatio-temporal reconstruction,” *Proc. of SPIE Symp. Elect. Imag.*, vol. 6814, 2008.
 33. R. Delgado Gonzalo and **J. G. Brankov**, “Mesh model 2D reconstruction operator for SPECT,” *Proc. of SPIE Symp. Medical Imag.*, vol. 6913, 2008.
 34. K. Majidi, J. Brankov, M. Wernick, “Sampling Strategies in Multiple-Image Radiography,” *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 688-691, 2008.
 35. **J. G. Brankov**, P. H. Pretorius, “How many reconstruction methods are needed for numerical observer design?,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 5387-5390, 2008.
 36. **J. G. Brankov** and P. H. Pretorius, “Feature selection for learning-machine numerical observer,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 4440-4443, 2008.
 37. K. Majidi, **J. G. Brankov**, and M. N. Wernick, “Parameter estimation in multiple-image radiography,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 4214-4217, 2008.

38. T. Marin, M. N. Wernick, Y. Yang, and **J. G. Brankov**, "Motion-compensated spatio-temporal filtering of cardiac gated SPECT images," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 3734-3737, 2008.
39. P. H. Pretorius, M. A. King, M. N. Wernick, and **J. G. Brankov**, "Estimating Tl-201 redistribution in the heart at rest using stress perfusion SPECT Imaging," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, pp. 5403-5406, 2008.
40. M. Jin, Y. Yang, **J. G. Brankov**, M. N. Wernick, and M. A. King, "Four-dimensional Reconstruction of Gated cardiac SPECT with Attenuation and Scatter compensation," *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 169-172, 2007.
41. L. C. Cobo, **J. G. Brankov** "Evaluation of model based parametric image estimation in MIR," *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 452-455, 2007.
42. M. Jin, Y. Yang, **J. G. Brankov**, M. N. Wernick, Bing Feng, P. H. Pretorius, and M. A. King, "Four-dimensional gated cardiac SPECT reconstruction and evaluation study," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 5, pp. 3892-3897, 2007.
43. R. Delgado Gonzalo and **J. G. Brankov**, "Mesh model based projection operator for emission Tomography," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 4, pp. 2760-2763, 2007.
44. K. Majidi, **J. G. Brankov**, and M. N. Wernick, "Limited-angle tomography for multiple-image radiography," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 4, pp. 3098-3101, 2007.
45. B. Marquet, **J. G. Brankov**, and M. N. Wernick, "Noise and sampling analysis for Multiple-Image Radiography," *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp.1232-1235 2006.
46. M. N. Wernick, Y. Yang, **J. G. Brankov**, L. Wei, I. M. El-Naqa, N. P. Galatsanos, "Machine learning of human responses to images," *Proc. of SPIE Symp. Elect. Imag.*, vol. 6065, 2006.
47. M. N. Wernick, **J. G. Brankov**, Y. Yang, G. Khelashvili, D. Chapman, I. Mondal, B. Marquet, and Z. Zhong, "Progress in multiple-image radiography," *Proc. of SPIE Symp. Elect. Imag.*, vol. 6065, 2006.
48. C.-Y. Chou, J. Brankov, Miles Wernick, and Mark Anastasio, "A comparison of a generalized DEI method with multiple-image radiography (MIR)," *Proc. of SPIE Symp. Optics and Phot.*, vol. 6318, 2006.
49. **J. G. Brankov**, L. Wei, Y. Yang, M. N. Wernick, "Generalization Evaluation of Numerical Observers for Image Quality Assessment," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 3, pp. 1696-1698, 2006.
50. **J. G. Brankov** and L. C. Cobo Rus, "Iterative Method for Multiple-Image Radiography Parametric Image Estimation," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 3, pp. 1684-1686, 2006.
51. M. Jin, M. N. Wernick, Y. Yang, **J. G. Brankov**, E. Gravier, B. Feng and M. A. King, "5D Image Reconstruction for Tomographic Image Sequences," *Conf. Rec. the Fortieth Asilomar Conf. on Sig., Sys. and Comp.*, pp.1973-1977, 2006.
52. **J. G. Brankov**, G. Khelashvili, D. Chapman, M. A. Anastasio, Y. Yang, Z. Zhong, M. N. Wernick, "Physical Model of Image Formation in Multiple-Image

- Radiography,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 4 pp. 2320-2322, 2005.
53. **J. G. Brankov**, A. Saiz-Herranz and M. N. Wernick “Task-Based Evaluation of Diffraction-Enhanced Imaging,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol.3, pp. 23-29, 2005.
 54. **J. G. Brankov**, A. Saiz-Herranz, and M. N. Wernick, “Noise analysis for diffraction enhanced imaging,” *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, vol. 2, pp. 1428 - 1431, 2004.
 55. **J. G. Brankov**, M. N. Wernick, D. Chapman, Z. Zhong, C. Muehleman, Jun Li, Mark Anastasio, “Multiple-image computed tomography,” *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, vol. 1, pp. 948- 951, 2004.
 56. M. N. Wernick, **J. G. Brankov** and A. Sáiz-Herranz, “Noise analysis and image denoising for DEI,” *Proc. of SPIE Int. Symp. Opt. Sci. and Tech.*, vol. 5535, pp. 660-668, 2004.
 57. M. N. Wernick, **J. G. Brankov**, D. Chapman, Y. Yang, C. Muehleman, Z. Zhong, and M. A. Anastasio, “Multiple-image radiography and computed tomography,” *Proc. of SPIE Int. Symp. Opt. Sci. and Tech.*, vol. 5535, pp. 369-379, 2004.
 58. **J. G. Brankov**, Y. Yang, B. Feng, M. A. King, and M. N. Wernick, “4D Smoothing of gated SPECT images using a left-ventricle shape model and a deformable mesh,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol.5, pp. 2845-2848, 2004.
 59. K. Majidi, **J. G. Brankov**, and M. N. Wernick, “Tomosynthesis implementation of multiple image radiography,” *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 832-835, 2007.
 60. Y. Yang, **J. G. Brankov**, N. P. Galatsanos, “Content-adaptive mesh modeling for image inverse problems,” *Proc. of SPIE Symp. Elect. Imag.*, vol. 5016, pp. 173-184, 2003.
 61. **J. G. Brankov**, Y. Yang, and N. P. Galatsanos “Image restoration using content-adaptive mesh modeling” *IEEE Int. Conf. on Image Process.*, vol.2, pp. II-997-1000, 2003
 62. **J. G. Brankov**, Y. Yang, and M. N. Wernick, “Accurate mesh representation of vector-valued (color) images,” *IEEE Int. Conf. on Image Process.*, vol.1, pp. I-705-708, 2003.
 63. **J. G. Brankov**, I. El Naqa, Y. Yang, M. N. Wernick, “Learning a nonlinear channelized observer for image quality assessment,” *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol 4., pp. 2526-2529, 2003.
 64. **J. G. Brankov**, Y. Yang, R. M. Leahy, and M. N. Wernick, “Multi-modality tomographic image reconstruction using mesh modeling,” *IEEE Int. Symp. BioMedical Imag.: From Nano to Macro*, pp. 405-408, 2002.
 65. **J. G. Brankov**, Y. Yang, and M. N. Wernick, “Content-adaptive 3D mesh modeling for representation of volumetric images,” *IEEE Int. Conf. on Image Process.*, vol. 3, pp 849-852, 2002.
 66. **J. G. Brankov**, Y. Yang, and M. N. Wernick, “Content-adaptive mesh modeling for fully-3D tomographic image reconstruction,” *IEEE Int. Conf. on Image Process.*, vol. 2, pp. 621-624, 2002.

67. **J. G. Brankov**, N. P. Galatsanos, Y. Yang, and M. N. Wernick, "Similarity based clustering using the expectation-maximization algorithm," *IEEE Int. Conf. on Image Process.*, vol. 1, pp. 97-100, 2002.
68. Ping Dong, **J. G. Brankov**, Nikolas Galatsanos, and Y. Yang, "Geometric robust watermarking based on a new mesh model correction," *IEEE Int. Conf. on Image Process.*, vol.3, pp. 493-496, 2002.
69. **J. G. Brankov**, Y. Yang, M. V. Narayanan, M. N. Wernick "Motion-compensated 4D processing of gated SPECT perfusion studies," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 3, pp. 1380-1384, 2002.
70. **J. G. Brankov**, N. P. Galatsanos, Y. Yang, M. N. Wernick "Image-sequence segmentation based on an EM algorithm for similarity clustering," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 2, pp. 1211-1216, 2002.
71. **J. G. Brankov**, Y. Yang, and M. N. Wernick, "Tomographic image reconstruction using content-adaptive mesh modeling," *IEEE Int. Conf. on Image Process.*, vol. 1, pp. 690-693, 2001.
72. Y. Yang, M. N. Wernick, and **J. G. Brankov**, "A fast algorithm for accurate content-adaptive mesh generation," *IEEE Int. Conf. on Image Process.*, vol. 3, pp. 868-871, 2001.
73. **J. G. Brankov**, M. N. Wernick, Y. Yang, and M. V. Narayanan, "Spatially-adaptive temporal smoothing for reconstruction of dynamic and gated image sequences," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 2, 15/146-15/150, 2000.
74. **J. G. Brankov**, J. Djordjevic, M. N. Wernick, and N. P. Galatsanos, "Tomographic image reconstruction for systems with partially-known blur," *IEEE Int. Conf. on Image Process.*, vol. 3, pp. 881-885, 1999.
75. **J. G. Brankov**, J. Djordjevic, N. P. Galatsanos, and M. N. Wernick, "PET image reconstruction with allowance for errors in the system model," *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, vol. 3, pp. 1163-1167, 1999.

Abstracts and unpublished conference presentations:

1. **J. G. Brankov**, F. Massanes, "," *XV Medical Imag. Perception Conf.*, 2013.
2. F. Massanes, **J. G. Brankov**, "OpenCL-Accelerated Computation of a 3D SPECT Projection Operator for Content Adaptive Mesh Model," *The Twelfth Int. Meeting on Fully 3D Image Reconstruction in Radiology and Nuclear Medicine*, Lake Tahoe, CA, 2013.
3. **J. G. Brankov** and F. Massanes, "Model Observer Tool Kit (MOTOKit)," Live demo session at *SPIE Symp. Medical Imag.*, 2013,
4. **J. G. Brankov**, "Optimization of the Channelized Hotelling Observer Internal-Noise Model in a Train-Testing Paradigm," *XIV Medical Imag. Perception Conf.*, 2011.
5. F. M. Parages, M. N. Wernick, T. S. Denney Jr., and **J. G. Brankov**, "3D extension for a Deformable Mesh Model of Cardiac Motion from Tagged and Untagged MRI Data," presented at *IEEE Nucl. Sci. Symp. and Medical Imag. Conf. Rec.*, 2010.
6. J. Li, **J. G. Brankov**, M. N. Wernick, Z. Zhong, and C. Muehleman, "Multiple-Image Computed Tomography for Human Articular Cartilage," *52nd Ann. Meeting of the Orthopedic Research Society*, Chicago, IL, CA, 2006.

7. C. Parham, E. Pisano, C. Livasy, L. Faulconer, M. Wernick, **J. Brankov**, M. Kiss, D. Connor, J. Chen, A. Wu, Z. Zhong, D. Chapman, "Application of the Multiple Image Radiography Method to Breast Imaging," *8th Int. Workshop on Digital Mammography*, edited by S. M. Astley, et al, Lectures Notes in Computer Science, vol. 4046, pp. 289-298, 2006.
8. C. Parham, E. Pisano, C. Li vasy, L. Faulconer, M. Wernick, **J. Brankov**, M. Kiss, D. Connor, J. Chen, A. Wu, Z. Zhong, D. Chapman, "Application of the Multiple Image Radiography Method to Breast Imaging," *Int. Workshop on Digital Mammography*, June 18-21, 2006.
9. C. Muehleman, **J. G. Brankov**, J. Li, Z. Zhong, K. E. Kuettner, and M. N. Wernick, "Multiple-image radiography for soft tissue," *50th Ann. Meeting of the Orthopedic Research Society*, San Francisco, CA, 2004.
10. C. Muehleman, Jun Li, Miles Wernick, **J. Brankov**, Klaus Kuettner, Z. Zhong "Yes, You Can See Cartilage With X-rays (Diffraction Enhanced Imaging for Cartilage and Bone)," *34th Int. Sun Valley workshop on skeletal tissue biology*, Sun Valley, Idaho, 2004.
11. **J. G. Brankov**, Y. Yang, M.N. Wernick, and M.V. Narayanan, "Content-adaptive mesh modeling for tomographic image reconstruction," *The Sixth Int. Meeting on Fully 3D Image Reconstruction in Radiology and Nuclear Medicine*, Pacific Grove, CA, 2001.
12. **J. G. Brankov**, Y. Yang, M.N. Wernick, and M.V. Narayanan, "4D processing of gated SPECT images using deformable mesh modeling," *The Sixth Int. Meeting on Fully 3D Image Reconstruction in Radiology and Nuclear Medicine*, Pacific Grove, CA, 2001.
13. **J. G. Brankov**, J. Djordjevic, M. N. Wernick, and N. P. Galatsanos, "Tomographic image reconstruction for systems with partially-known blur," *Future Directions in Nuclear Medicine Physics and Engineering*, Chicago, IL, 1999.
14. **J. G. Brankov**, "Wideband BPSK interference suppression in DSSS communication system by two-sided transversal filter," *Telfor '96*, Belgrade, Yugoslavia, 1996.

Internal press accounts of research

1. "In Search of a Cure," *IIT Magazine*, Fall 2005.
2. "Developing less painful, more precise mammograms," *ECE Magazine*, pp. 6, 2006.
3. "From the Heart: J. Brankov's Patient Observations," *IIT Magazine*, pp.12, Fall 2008.
4. "Heart Glows with New Approach to Diagnosis," *2008 IIT Annual Report*, pp. 21, 2008.
5. "The Best Way to See a Broken Heart," *ECE Magazine*, pp. 10-11, 2008.
6. "Phase contrast imaging," *IIT Magazine*, pp.19, Spring 2010.
7. "Predicting the diagnostic performance of doctors," *IIT Magazine*, pp.19, Spring 2010.

INVITED PRESENTATIONS

1. **J. G. Brankov**, “Cardiac 3D, 4D and 5D Imaging,” Central Chapter Society of Nuclear Medicine Spring Meeting, a, Spring, 2010.
2. **J. G. Brankov**, “Automated image quality assessment for nuclear cardiology,” University of Massachusetts - Medical School, Worcester, April 2009.
3. **J. G. Brankov**, “Automated image diagnostic-quality characterization,” Chicago Midwest Regional AIChE Conference, October, 2009.
4. **J. G. Brankov**, “Medical imaging research at IIT,” University of Novi Sad, Novi Sad, Serbia, summer, Fall, 2009.
5. **J. G. Brankov**, “Data Processing in Medical Imaging,” Illinois Institute of Technology, ECE department Distinguished Speaker Seminar Series, Chicago, IL, March, 2006.
6. **J. G. Brankov**, “New class of numerical observers for nuclear cardiology and future collaboration,” SIEMENS, Siemens Medical Solutions USA, Inc. Nuclear Medicine Group, Hoffman Estates, IL, December, 2006.
7. **J. G. Brankov** and A. S. Lukic, “Research in medical image analysis and processing at IIT,” Pritzker Institute of Biomedical Science and Engineering, Illinois Institute of Technology, Chicago, IL, May 06, 2004.
8. **J. G. Brankov**, “Analysis, Reconstruction and Spatio-Temporal Processing of Medical Images,” SIEMENS, Siemens Medical Solutions USA, Inc. Nuclear Medicine Group, Hoffman Estates, IL, July 9, 2004.
9. **J. G. Brankov**, “Spatio-Temporal Processing of Medical Images,” Illinois Institute of Technology, ECE department Distinguished Speaker Seminar Series, Chicago, IL, September, 2004.
10. M. N. Wernick, **J. G. Brankov** (presenter), D. Chapman, Y. Yang, C. Muehleman, Z. Zhong, and M. A. Anastasio, “Multiple-image radiography and computed tomography,” The SPIE 49th Annual Meeting, Denver, CO, August 2004.

PATENTS AND INVENTION DISCLOSURES

Other inventions disclosed:

1. Y. Yang, M. N. Wernick, and **J. G. Brankov**, “Method of generating a mesh representation of an image or other function,” submitted to Illinois Institute of Technology, Chicago, IL.
2. Y. Yang, M. N. Wernick, and **J. G. Brankov**, “Tomographic image reconstruction based on content-adaptive mesh modeling,” submitted to Illinois Institute of Technology, Chicago, IL.

FUNDING FOR RESEARCH AND EDUCATION

GRANTS AND CONTRACTS FROM EXTERNAL SOURCES

Total Active funding (as P.I. or subcontract P.I.): \$2,667,353

GRANTS OR CONTRACTS AS SOLE P.I.

(Proposal success rate as P.I.: 100%)

1. **National Institutes of Health (NIH/NHLBI) R01 (HL091017)**, “New Class of Numerical Observers for Nuclear Cardiology,” 03/15/2008 - 02/28/2014, **\$2,143,807**. Role: P.I. (Contribution: **100%**; Peer-review: Yes; Indirect cost rate: 50% (full); Months per year of effort: 3.0)

The major goal of this project is to investigate new task-based image quality measures for cardiac imaging. As P.I., I conceived of the main ideas, and have served as overall leader of the project.

2. **National Institutes of Health (ARRA NIH/NHLBI) R01 (HL091017)**, ARRA supplement, 07/15/2009 - 06/30/2012, **\$229,517**. Role: P.I. (Contribution: **100%**; Peer-review: supplement to peer-reviewed grant; Indirect cost rate: 50% (full); Months per year of effort: 0.0)

This grant is to support a post-doc to help in progress of the HL91017 parent grant. The major goal of this project is to investigate new task-based image quality measures for cardiac imaging. As P.I., I conceived of the main ideas, and have served as overall leader of the project.

GRANTS OR CONTRACTS AS SUBCONTRACT P.I.

3. **National Institutes of Health (NIH/NIBIB) R01 (EB012070)**, “Reliable Human-Model Observers for Emission Tomography,” 09/01/2010-08/31/2014, **\$69,952**. Role: Subcontract P.I., P.I. is H. Gifford, Univ. of Houston, (Contribution: **100%**; Peer-review: Yes; Indirect cost rate: 51% (full); Months per year of effort: 0.5).

The goal is to develop reliable and accurate numerical observers for technology evaluations in emission tomography. As a subcontract P.I., I conceived the idea of using machine learning methods for human search pattern prediction. I also serve as leader of the subcontract at IIT.

4. **National Institutes of Health (NIH/NHLBI) R01 (EB009715)**, “Design Studies and Optimization of Phase-Contrast Mammography,” 02/15/2010- 02/28/2014, **\$224,077**. Role: Subcontract P.I., P.I. is M. Anastasio, Washington University St. Louis. (Contribution: **50%**; Peer-review: Yes; Indirect cost rate: 51% (full); Months per year of effort: 1.0).

The goal is to develop and optimize phase-contrast mammography. As a subcontract P.I., I lead experimental efforts at Advanced X-ray Imaging Laboratory (AXIL) at MIRC, IIT. I also serve as leader of the subcontract at IIT.

COMPLETED GRANTS OR CONTRACTS AS PARTICIPANT / INVESTIGATOR

5. **National Institutes of Health (NIH/NHLBI) R01 (HL065425)** “4D and 5D image reconstruction for cardiac SPECT,” 12/06/2004-11/30/2010, **\$1,611,717**. Role: Investigator, P.I. was M. N. Wernick, Illinois Institute of Technology.

6. **National Institutes of Health (NIH/NCI) R01 (CA111976)** “*Multiple-image radiography of breast,*” 07/07/2005-05/31/2009, **\$1,738,208**. Role: Investigator, P.I. was M. N. Wernick, Illinois Institute of Technology.
7. **National Institutes of Health (NIH/NIAMS) BRP**, “Novel x-ray technologies for degenerative joint disease research,” 06/01/2002-05/31/2007, **\$3,500,000**. Role: Investigator, P.I. was K. Kuettner, Rush Hospital.
8. **National Institutes of Health (NIH/NHLBI R01) (HL065425)** ”4D image reconstruction for gated cardiac SPECT,” 08/01/2000-12/06/2004, **\$1,140,381**. Role: Investigator, P.I. was M. N. Wernick, Illinois Institute of Technology.
9. **Whitaker Foundation**, “Development of a content-adaptive mesh modeling approach to improve image quality in tomographic image reconstruction,” 10/01/2000-08/31/2003, **\$210,000**. Role: Investigator, P.I. was Y. Yang, Illinois Institute of Technology.
10. **National Institutes of Health (NIH/NINDS) R29 (NS034069)**, “Space-time image processing for dynamic nuclear medicine,” 01/01/1997-12/31/2002, **\$541,857**. Role: Investigator, P.I. was M. N. Wernick, Illinois Institute of Technology.

GRANTS AND CONTRACTS FROM INTERNAL SOURCES

None.

GRANTS PROPOSALS UNDER PREPARATION

1. “Task based model observers for X-Ray CT,” Estimated budget \$1,250,000; Agency: National Institutes of Health.
2. “Small animal phase contrast imaging”, Estimated budget \$950,000; Agency: National Institutes of Health

ACADEMIC-YEAR SALARY RECOVERY (CHARGE-OFF)

Academic Year	% of 9-month salary from grants
2009-10	11.11% (1 months)
2010-11	16.6% (1.5 months)
2011-12	16.6% (1.5 months)
2013-14	11.11% (1 months)
Average	13.85%

EXTERNAL SUPPORT OF GRADUATE STUDENTS, RESEARCH STAFF & FACULTY

GRADUATE STUDENTS

Full support

1. Iris Lorente, Research Assistant, 01/2013- present.
2. Oriol Caudevilla, Research Assistant, 01/2013- present.

3. Francesc Massanes Basi, Research Assistant, 09/2012-present.
4. Thibault Marin, Research Assistant, 05/2010-12/2010.
5. Felipe M. Parages Oosterling, Research Assistant, 02/2010-present.
6. Xiaofeng Niu, Research Assistant, 09/2009-05/2010.
7. Luis De Sisternes Garcia, Research Assistant, 09/2009-05/2010.

VISITING RESEARCH STUDENTS

Tuition support

1. Alberto Moreno Herrero, Fall, 2008.
2. Javier Arjona, Fall, 2008.
3. Felipe M. Parages Oosterling, Spring, 2009.
4. Aurora Madrid, Summer, 2009.
5. Alejandro Diez Perales, Summer, 2009.
6. Alex González Paredes, Summer, 2009.
7. Carlos Perez-Inigo Alvarez, Spring, 2010.
8. Francesc Massanes Basi, Spring, 2010.
9. Marc Lain, Fall 2010 - Spring 2011
10. Marie Cadennes, Fall, 2010.
11. Jorge Soriano, Spring, 2011.
12. Mireia Calvo, Spring, 2011.
13. Pierre Bedoucha, Spring, 2011.
14. Iris Lorente, Spring, 2012.
15. Oriol Caudevilla, Spring, 2012.

RESEARCH STAFF

1. Wei Zhou Post-Doc 50% salary support 2009 – present.

PROFESSIONAL ACTIVITIES

PROFESSIONAL AFFILIATIONS

Senior Member, Institute of Electrical and Electronics Engineers (IEEE), (Student member 1999, Member 2002, Senior Member since 2005).

Member, Sigma Xi (Member since 2008).

Member, Society for Imaging Science & Technology (IS&T) (Member since 2008).

PROFESSIONAL / TECHNICAL SOCIETY ACTIVITIES

Editorial positions

Associate Editor, *Journal of Electronic Imaging* (SPIE and IS&T), 2011 – present.

Associate Editor, *Medical Physics* (AAPM), 2005 – present.

Program committee, IEEE International Symposium on Biomedical Imaging (ISBI), 2011.

Program committee, SPIE Image Perception, Observer Performance, and Technology Assessment Conference (SPIE Medical Imaging Meeting), 2011 – present.

Program Committee, International Conference on Bio-inspired Systems and Signal Processing - BIOSIGNALS 2013, 2012 – present.
Assistant to Commissioning Editor, SPIE Newsroom in the field of Biomedical Optics and Medical Imaging 2012 – present.

Technical society service (committees served, leadership positions held, etc.)

Associate Member (elected 2011- present), BioImaging and Signal Processing (BISP) Technical Committee of the IEEE Signal Processing Society
IEEE Senior Member Panel Meeting, Chicago, IL, 11 September 2010.
Session Chair, "Image Segmentation," IEEE International Symposium on Biomedical Imaging (ISBI), 2011
Session Chair, "Other Medical Imaging Technologies," IEEE International Nuclear Science Symposium, Medical Imaging Conference (MIC), 2012
Session Chair, "Image Perception, Observer Performance, and Technology Assessment: Model observer," SPIE Medical Imaging Meeting, 2013
Session Chair, "Segmentation I," IEEE International Symposium on Biomedical Imaging (ISBI), 2013
Best Student Paper Award Committee Member, ISBI 2013

Grant proposal reviewer

U.S. Civilian Research & Development Foundation, Qatar National Research Fund, 2007 – present.
The Center for Scientific Review at the NIH, meeting Title: RFA OD-09-003 Challenge Grants Panel # 23; Meeting Identifier: 2009/10 ZRG1 SBIB-V (58) R; 2009.
Italian Ministry of Health in association with US National Institutes of Health, 2009 - present.
Research Foundation – Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO), Belgium 2013

Reviewer for journals, conferences, and books

Served as reviewer for the following:

<u>Journals (alphabetical order)</u>	(Average impact factor: 1.79(2009))
1. Elsevier Signal Processing	(IF: 1.13)
2. IEEE Transactions on Biomedical Engineering	(IF: 2.41)
3. IEEE Transactions on Image Processing	(IF: 2.84)
4. IEEE Transactions on Medical Imaging	(IF: 3.27)
5. IEEE Signal Processing Letters	(IF: 1.17)
6. IEEE Transactions on Information Technology in BioMedicine	(IF: 1.57)
7. IOP Inverse Problems	(IF: 1.90)
8. IOP Physiological Measurement	(IF: 1.43)
9. IOP Physics in Medicine and Biology	(IF: 2.78)
10. IOS J. of X-ray Science and Technology	(IF: 0.57)

- 11. OSA Optics Express (IF: 3.27)
- 12. SPIE & IS&T J. of Electronic Imaging (IF: 0.44)
- 13. SPIE Optical Engineering (IF: 0.55)
- 14. MDPI Sensors (IF: 1.82)

Conferences

- 1. IEEE Medical Imaging Conference (NSS-MIC)
- 2. IEEE International Conference on Technology and Automation
- 3. IEEE Engineering in Medicine and Biology Conference (EMBS)
- 4. International Society and Conference Series on Medical Image Computing and Computer-Assisted Intervention (MICCAI)
- 5. IEEE International Symposium on Biomedical Imaging (ISBI)
- 6. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
- 7. IEEE International Conference on Image Processing (ICIP)

EDUCATIONAL ACTIVITIES

TEACHING EXPERIENCE

Semester	Course title	Course number	Evaluation score	Class size	TV/Internet course
S 2008	Digital Image Processing	ECE 481	4.57	22	X
F 2008	Statistical Pattern Recognition	ECE 566	4.13	50	X
S 2009	Digital Signal Processing II	ECE 569	4.00	36	X
F 2009	Digital Speech Processing	ECE 568	2.80	28	X
S 2010	Computer Vision & Image Processing	ECE 565	3.65	47	X
F 2010	Digital Signal Processing I	ECE 436/437	3.73	81	
S 2011	Computer Vision & Image Processing	ECE 565	4.05	54	X
F 2011	Digital Signal Processing I	ECE 436/437	3.79	55	
S 2012	Computer Vision & Image Processing	ECE 565	4.48	45	X
F 2012	Digital Signal Processing I	ECE 436/437	4.10	80	
S 2013	Computer Vision & Image Processing	ECE 565	4.35	41	X
Average teaching evaluation score:			3.96/5.00	539	

 Research and special projects

Semester	Course title	Course number	Evaluation score	Class size	TV/Internet course
SU2008	Special Projects	ECE 594-158	-	4	
F 2008	Special Problems	ECE 597-158	-	3	
	Special Projects	ECE 594-158	-	1	
S 2009	Special Problems	ECE 597-158	-	2	
	Special Projects	ECE 594-158	-	3	
SU 2009	Special Projects	ECE 594-158	-	3	
	Special Problems	ECE 597-158	-	1	
F 2009	Special Project	ECE 594-158	-	2	
	Research and Thesis for Ph.D.	ECE 691-158	-	2	
S 2010	Research and Thesis for M.S.	ECE 591-158	-	1	
	Special Projects	ECE 594-158	-	4	
	Research and Thesis for Ph.D.	ECE 691-158	-	2	
SU 2010	Research and Thesis for M.S.	ECE 591-158	-	2	
	Special Projects	ECE 594-158	-	3	
	Special Problems	ECE 597-158	-	1	
F 2010	Research and Thesis for M.S.	ECE 591-158	-	2	
	Special Projects	ECE 594-158	-	1	
	Research and Thesis for Ph.D.	ECE 691-158	-	2	
S 2011	Research and Thesis for M.S.	ECE 591-158	-	1	
	Research and Thesis for Ph.D.	ECE 691-158	-	2	
	Special Projects	ECE 594-158	-	3	
SU 2011	Research and Thesis for Ph.D.	ECE 691-158	-	1	
	Special Projects	ECE 594-158	-	1	
	Special Problems	ECE 597-158	-	1	
F 2011	Research and Thesis for Ph.D.	ECE 691-158	-	3	
S 2012	Research and Thesis for Ph.D.	ECE 691-158	-	3	
	Special Projects	ECE 594-158	-	1	
	Special Problems	ECE 597-158	-	2	
SU 2012	Research and Thesis for Ph.D.	ECE 691-158	-	1	
	Special Projects	ECE 594-158	-	1	
F 2012	Research and Thesis for Ph.D.	ECE 691-158	-	3	
	Special Projects	ECE 594-158	-	1	
	Special Problems	ECE 597-158	-	1	
S 2013	Research and Thesis for Ph.D.	ECE 691-158	-	3	
	Research and Thesis for M.S.	ECE 591-158	-	2	

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DISSERTATIONS SUPERVISED

Ph.D. Thesis Students (completed)

1. Thibault Marin, Ph.D. Thesis, "Cardiac Motion in gated SPECT," ECE Dept., Illinois Institute of Technology, Fall 2010.

Current Ph.D. Students (in progress)

2. Keivan Majidi, "Simulation and Experimental Development of an Analyzer-Based Phase-Contrast Imaging System," Expected graduation: Summer/Fall 2013
3. Felipe M. Parages Oosterling "Model observer estimation for defect detection and localization," Expected graduation: Spring 2014

4. Francesc Massanes Basi “Machine Learning for Human Template Estimation”, Expected graduation: Spring 2014
5. Iris Lorente, “TBD,” Expected graduation: Spring 2015
6. Oriol Caudevilla, “Parametric Image Estimation for Analyzer-Based Phase-Contrast Imaging System ,” Expected graduation: Spring 2015.

M.S. Thesis Students (completed)

7. Alejandro Saiz, M.S. Thesis, “Noise analysis of diffraction enhanced imaging,” (co-advised with M. N. Wernick), ECE Dept., Illinois Institute of Technology, 2003.
8. Luis Carlos Cobo Rus, M.S. Thesis, “Model-based method for Multiple-Image Radiography with distributed computation implementation,” ECE Dept., Illinois Institute of Technology, 2006.
9. Keivan Majidi, M.S. Thesis, “Sampling Strategies and Limited-Angle Tomography for Multiple-Image Radiography,” ECE Dept., Illinois Institute of Technology, 2008.
10. Mahdi Mahmoudkalayeh, M.S. Thesis, “Numerical Observer for Image Quality Assessment using Multi Kernel Relevance Vector Machine,” ECE Dept., Illinois Institute of Technology, Fall, 2010.
11. Felipe M. Parages Oosterling, M.S. Thesis, “Myocardium Deformable Mesh Model from MRI data,” ECE Dept., Illinois Institute of Technology, Spring, 2011.
12. Francesc Massanes Basi, M.S. Thesis “Numerical Observer for Motion Quality Assessment,” ECE Dept., Illinois Institute of Technology, Spring, 2011.

OTHER STUDENT RESEARCH PROJECTS SUPERVISED

Research projects supervised

1. Stephane Jithendran M.S. project title: “Detection and analysis of calcium sparks in muscle cells,” ECE Dept., Illinois Institute of Technology, 2006
2. Bruno Marquet, ENSEA, Cergy-Pontoise (co-advised with M. N. Wernick), Project title: “Noise Analysis and Sampling Strategies for Multiple-Image Radiography,” Fall, 2005.
3. Nadir El Jouaidi, ENSEA, Cergy-Pontoise, (administrative advisor M. N. Wernick), Project title: High-resolution camera design,” Summer, 2006.
4. Thibault Marin, ENSEA, Cergy-Pontoise (administrative advisor M. N. Wernick), Project title: Image retrieval,” Summer, 2006.
5. Ricard Delgado Gonzalo, UPC, Barcelona, Project title: “Mesh based forward projection model for SPECT,” Summer, 2007.
6. Cristina Gómez Moreno, UPM, Madrid, Project title: “Mesh modeling for Tomographic reconstruction,” Summer, 2008.
7. Guille Alonso, UPM, Madrid, Project title: “Phase Contrast X-ray imaging,” Summer, 2008.
8. Alberto Moreno Herrero, UPM, Madrid Project title: “Matlab for web applications,” Fall, 2008.
9. Javier Arjona, UPM, Madrid, Project title: “Evaluation of the Channelized Hotelling Observer,” Fall, 2008.
10. Felipe M. Parages Oosterling, UPM, Madrid, Project title: “Deformable mesh modeling of cardiac motion from tagged MRI data,” Spring, 2009.

11. Aurora Madrid, UPM, Madrid,
Project title: "Tomographic image reconstruction using CUDA," Summer, 2009.
12. Alejandro Diez Perales, UPM, Madrid,
Project title: "System Integration for X-ray computed tomography, " Summer, 2009.
13. Alex González Paredes, UPC, Barcelona,
Project title: "Deformable mesh modeling for cardiac motion estimation from MRI data," Summer, 2009.
14. Diane Helene Verriere, ENSERG/PHELMA-INPG, Grenoble,
Project title: "Learning Channelized Observers for Image Quality Assessment, " Summer, 2009.
15. Carlos Perez-Inigo Alvarez, UPM, Madrid,
Project title: "Least-Squares algorithm for image restoration, " Spring, 2010.
16. Francesc Massanes Basi, UPC, Barcelona,
Project title: "CUDA implementation of a block-matching algorithm for Multiple GPU cards," Spring, 2010.
17. Marc Lain, UPC, Barcelona,
Project title: "Image reconstruction," Fall 2010 - Spring 2011
18. Marie Cadennes, ENSEA, Cergy-Pontoise,
Project title: "2D and 3D block-matching motion estimation with CUDA technology," Fall, 2010.
19. Jorge Soriano, UPC, Barcelona,
Project title: "GPU based Matrix inversion," Spring, 2011.
20. Mireia Calvo, UPC, Barcelona,
Project title: "Optimization of a Numerical Observer Model," Spring, 2011.
21. Pierre Bedoucha, ENSEA, Cergy-Pontoise,
Project title: "Prediction of Visual Search Path," Spring, 2011.
22. Iris Lorente, UPC, Barcelon,
Project title: "Prediction of Visual Search Path," Spring, 2012.
23. Oriol Caudevilla, UPC, Barcelon, Spring, 2012.
Project title: "Prediction of Visual Search Gaze Points," Spring, 2012.

Special projects supervised

24. Sylvain Richard, ENSEA, Cergy-Pontoise, (co-advised with M. N. Wernick).
Project title: "MIR image segmentation," Summer, 2005.
25. Jaline Qu
Project title: "Content Aware Image Resizing," Summer, 2008.
26. Adam Berg,
Project title: "Image processing," Summer, 2008.
27. Nagarajan Balamukundan
Project title: "Content based image resizing," Spring, 2009.
28. Renferme Ludovic
Project title: "Speech morphing," Summer, 2010.

Supervised post-doctoral research associates

1. Christopher Parham MD-PhD, Student at University of North Carolina-Chapel Hill, Chapel Hill, NC. Graduated 2005; Advisor: Etta Pisano, M.D.

2. Ping Dong PhD, Senior Research Associate, Department of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, IL, 2004 – 2005.
3. Cheng-Ying Chou PhD, Senior Research Associate, Pritzker Institute of Biomedical Science and Engineer, Illinois Institute of technology, Chicago, IL, 2006.
4. Boris Marendic PhD, Research Associate, Medical Imaging Research Center, Illinois Institute of technology, Chicago, IL, 2008 – 2009.
5. Adam Zysk PhD, Research Associate, Medical Imaging Research Center, Illinois Institute of technology, Chicago, IL, 2008 – 2012.
6. Wei Zhou PhD, Research Associate, Medical Imaging Research Center, Illinois Institute of technology, Chicago, IL, 2009 – present.

Student awards

1. Keivan Majidi, ECE Research Day Poster Competition received the First Prize (M.S. Category), 2008.
2. Felipe M. Parages Oosterling, ECE Research Day Poster Competition runner-up (M.S. Category), 2008.
3. Nagarajan Balamukundan, ECE Research Day Poster Competition the First Prize (M.S. Category), 2009.

UNIVERSITY SERVICE

2007 - 2010	Served as a judge at ECE research day
2007 - present	Maintained cluster computing and data storage infrastructure for MIRC (6 faculty and 30+ students), IIT
2008 - present	Director of Advanced X-ray Imaging Laboratory (AXIL), IIT
2009 - 2010	Departmental/University Scholarship Committee, IIT
2010 - present	Area Coordinator for Signal Processing, ECE Dept, IIT
2012	Established co-terminal degree: Bachelor of Science in Biomedical Engineering (BME Dept.) and Master of Biomed Imaging and Signals (EE Dept.)

OTHER THESIS COMMITTEES SERVED

Thesis Committees for Graduate Students

1. Liu Lukai, (ECE Dept., IIT; Dr. I. S. Yetik, adviser),
M.S. Thesis: “Improved Prostate Cancer Localization With Spatially Regularized Dynamic Contrast Enhanced Magnetic Resonance Imaging,” 2009.
2. Ahren Ceisel, (BME Dept., IIT; Dr. D. Mogul, adviser),
PhD Proposal: “Decoding Motor Control Signals From the Neocortex Using Hierarchical Temporal Memory Networks: A Novel approach to Brain-Computer Interface Control,” 2009.
3. XiaoFeng Niu,
PhD Proposal: “Spatio-Temporal Reconstruction For Gated Cardiac SPECT,” 2010.
4. Jianrui Long, (ECE Dept., IIT; Dr. G. Williamson, adviser),
MS Thesis: “Speed of Response Analysis of Renal Autoregulation with Step Pressure Change,” 2010,

5. Mengxi Zhang, (ECE Dept., IIT; Dr. I. S. Yetik, adviser),
MS Thesis: "Feature Ranking and Selective Denoising for Prostate Cancer Localization with Multispectral MRI," 2010.
6. Girish Mallya, (ECE Dept., IIT; Dr. I. S. Yetik, adviser),
MS Thesis: "Prostate Cancer Localization using Texture with Multi-spectral MRI," 2010.
7. Robert Dawe, (BME Dept. Dr. K. Arfanakis, adviser),
Ph.D. Thesis: "Postmortem MRI of The Elderly Human Brain: Methods and Applications to Histopathologically Verified Alzheimer's Disease and other Neuropathologies of Aging," (Proposal Summer, 2009), Spring, 2011.
8. Muhammad Salman Haleem, (ECE Dept., IIT; Dr. I. S. Yetik, adviser),
MS Thesis: "A Task-based Approach to Parametric Imaging with Dynamic Contrast-Enhanced MRI," Spring 2011.
9. Niloufar Totonchi Afshar, (ECE Dept., IIT; Dr. I. S. Yetik, adviser)
MS Thesis: "Improved Dynamic Contrast Enhanced MR Imaging with an Application to Prostate Cancer," Spring 2011.
10. Yan Yang, (ECE Dept., IIT; Dr. Y. Yang, adviser),
MS Thesis: "Incorporating Invariance into Support Vector Machine for Detection of Microcalcifications," Fall 2011
11. Luis de Sisternes, (ECE Dept., IIT; Dr. Miles N Wernick, adviser),
PhD Proposal: "Feasibility of analyzer-based breast imaging and a three-dimensional computational breast lesion model," (Proposal 2010), Fall 2011.
12. Lu Liu, (ECE Dept., IIT; Dr. Y. Yang, adviser),
MS Thesis: TBD, Spring 2012
13. Katerina Kotrotsou, (BME Dept., IIT; Dr. K. Arfanakis, adviser),
PhD Proposal: "Prediction of neuropathology in the elderly using MR volumetry: A postmortem MRI, pathological, clinical study," Spring 2012.
14. Yusuf O. Artan, (ECE Dept., IIT; Dr. I. S. Yetik, adviser),
PhD Proposal: "Automatic and Interactive Image Segmentation techniques with Applications to Prostate Cancer," (Proposal 2011), Spring 2013.
15. Shengwei Zhang, (BME Dept., IIT; Dr. K. Arfanakis, adviser),
PhD Proposal: "Human Brain Diffusion Tensor Template for Inter-subject Spatial Normalization: Development, evaluations of Efficacy and Variability," (Proposal 2011), Spring 2013.

Comprehensive Exam Committees

16. Daniel Krieglstein, (Psychology Dept., IIT; Dr. Tamara Sher, adviser), 2008.
17. David Israel Mendoza Serrano, (Chemical and Environmental Engineering Dept., IIT; Dr. Ali Cinar, adviser), 2008.