BIOGRAPHICAL SKETCH

Name: **Jeffrey A. Fessler, Ph.D.**	Position Title: Professor
eRA Commons User Name: fessler	

Education/Training

Institution, Location	Degree	Year	Field of Study
Purdue University, W. Lafayette, IN	B.S.	1985	Electrical Engineering
Stanford University, Stanford, CA	M.S.	1986	Electrical Engineering
Stanford University, Stanford, CA	M.S.	1989	Statistics
Stanford University, Stanford, CA	Ph.D.	1990	Electrical Engineering

A. Positions

1986-1989 Research Assistant for A. Macovski, Electrical Engineering Dept., Stanford University, Stanford, CA
1990-1992 Research Fellow, Nuclear Medicine Division, University of Michigan, Ann Arbor, MI
1993-1995 Asst. Professor, Nuclear Medicine Division, University of Michigan, Ann Arbor, MI
1995-1997 Asst. Professor, Electrical Engin. and Comp. Sci. Dept., University of Michigan, Ann Arbor, MI
1998-2004 Assoc. Professor, Electrical Engin. and Comp. Sci. Dept., University of Michigan, Ann Arbor, MI
2004- Professor, EECS Dept., BME Dept., Dept. of Radiology, University of Michigan, Ann Arbor, MI
2006-2008 Associate Chair, ECE Division, EECS Dept., University of Michigan, Ann Arbor, MI

Honors

2009 10th Intl. Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine, Poster Award, for "A 3D forward and back-projection method for X-ray CT using separable footprint" by Yong Long, J A Fessler and J M Balter.
2007 University of Michigan Faculty Recognition Award
2006 IEEE Fellow, for contributions to theory and practice of image reconstruction
2005 UM College of Engineering Education Excellence Award
2003 EECS Department Outstanding Achievement Award
2002-5 AIMBE Fellow (American Institute for Medical and Biological Engineering)
2000 Henry Russel Award, Univ. of Michigan (university level award for scholarship and teaching)
1998 IEEE Signal Processing Society 1998 Best Paper Award: "Exploring estimator bias-variance tradeoffs using the uniform CR bound," AO Hero, JA Fessler, M Usman, IEEE Tr. Sig. Proc. 44(8):2026-41, Aug. 1996
1998 Biomedical Engineering Department Teaching Excellence Award
1994 Journal of Nuclear Medicine, Outstanding Manuscript Award (Human Studies) "In vivo mapping of cholinergic neurons in the human brain using SPECT and IBVM," D. E. Kuhl *et al.*, 35(3):405-10, Mar. 1994.
1993 Francois Erbsmann Investigator Award, Information Processing in Medical Imaging Conference. Best presentation by young investigator
1991-1992 Dept. of Energy Alexander Hollaender Distinguished Postdoctoral Fellowship
1990-1991 National Institutes of Health National Cancer Institute Postdoctoral Training Fellowship
1985-1988 National Science Foundation Graduate Fellowship

B. Journal publications (selected from over 110)

1. J. A. Fessler. Nonparametric fixed-interval smoothing of nonlinear measurements. *IEEE Tr. Sig. Proc.*, 39(4):907–13, Apr. 1991.
2. J. A. Fessler and A. Macovski. Object-based 3-D reconstruction of arterial trees from magnetic resonance angiograms. *IEEE Tr. Med. Im.*, 10(1):25–39, Mar. 1991.
3. J. A. Fessler, N. H. Clinthorne, and W. L. Rogers. Regularized emission image reconstruction using imperfect side information. *IEEE Tr. Nuc. Sci.*, 39(5):1464–71, Oct. 1992.
4. D. E. Kuhl, R. A. Koeppe, J. A. Fessler, S. Minoshima, R. J. Ackerman, J. E. Carey, D. L. Gildersleeve, K. A. Frey, and D. M. Wieland. In vivo mapping of cholinergic neurons in the human brain using SPECT and IBVM. *J. Nuc. Med.*, 35(3):405–10, Mar. 1994.

5. E. P. Ficaro, J. A. Fessler, W. L. Rogers, and M. Schwaiger. Comparison of Am-241 and Tc-99m as transmission sources for attenuation correction of Thallium-201 SPECT imaging of the heart. *J. Nuc. Med.*, 35(4):652–63, Apr. 1994.
6. P. C. Chiao, W. L. Rogers, N. H. Clinthorne, J. A. Fessler, and A. O. Hero. Model-based estimation for dynamic cardiac studies using ECT. *IEEE Tr. Med. Im.*, 13(2):217–26, June 1994.
7. J. A. Fessler. Penalized weighted least-squares image reconstruction for positron emission tomography. *IEEE Tr. Med. Im.*, 13(2):290–300, June 1994.
8. J. A. Fessler and A. O. Hero. Space-alternating generalized expectation-maximization algorithm. *IEEE Tr. Sig. Proc.*, 42(10):2664–77, Oct. 1994.
9. J. A. Fessler and A. O. Hero. Penalized maximum-likelihood image reconstruction using space-alternating generalized EM algorithms. *IEEE Tr. Im. Proc.*, 4(10):1417–29, Oct. 1995.
10. E. P. Ficaro, J. A. Fessler, P. D. Shreve, J. N. Kritzman, P. A. Rose, and J. R. Corbett. Simultaneous transmission/emission myocardial perfusion tomography: Diagnostic accuracy of attenuation-corrected 99m-Tc-Sestamibi SPECT. *Circulation*, 93(3):463–73, Feb. 1996.
11. J. A. Fessler. Mean and variance of implicitly defined biased estimators (such as penalized maximum likelihood): Applications to tomography. *IEEE Tr. Im. Proc.*, 5(3):493–506, Mar. 1996.
12. A. O. Hero, J. A. Fessler, and M. Usman. Exploring estimator bias-variance tradeoffs using the uniform CR bound. *IEEE Tr. Sig. Proc.*, 44(8):2026–41, Aug. 1996.
13. J. A. Fessler and W. L. Rogers. Spatial resolution properties of penalized-likelihood image reconstruction methods: Space-invariant tomographs. *IEEE Tr. Im. Proc.*, 5(9):1346–58, Sept. 1996.
14. A. O. Hero, M. Usman, A. C. Sauve, and J. A. Fessler. Recursive algorithms for computing the Cramer-Rao bound. *IEEE Tr. Sig. Proc.*, 45(3):803–7, Mar. 1997.
15. J. A. Fessler, E. P. Ficaro, N. H. Clinthorne, and K. Lange. Grouped-coordinate ascent algorithms for penalized-likelihood transmission image reconstruction. *IEEE Tr. Med. Im.*, 16(2):166–75, Apr. 1997.
16. J. A. Fessler. Spatial resolution and noise tradeoffs in pinhole imaging system design: A density estimation approach. *Optics Express*, 2(6):237–53, Mar. 1998.
17. A. O. Hero, R. Piramuthu, S. R. Titus, and J. A. Fessler. Minimax emission computed tomography using high resolution anatomical side information and B-spline models. *IEEE Tr. Info. Theory*, 45(3):920–38, Apr. 1999.
18. J. A. Fessler and S. D. Booth. Conjugate-gradient preconditioning methods for shift-variant PET image reconstruction. *IEEE Tr. Im. Proc.*, 8(5):688–99, May 1999.
19. M. Yavuz and J. A. Fessler. Penalized-likelihood estimators and noise analysis for randoms-precorrected PET transmission scans. *IEEE Tr. Med. Im.*, 18(8):665–74, Aug. 1999.
20. H Erdoğan and J. A. Fessler. Ordered subsets algorithms for transmission tomography. *Phys. Med. Biol.*, 44(11):2835–51, Nov. 1999.
21. J. A. Fessler, H Erdoğan, and W. B. Wu. Exact distribution of edge-preserving MAP estimators for linear signal models with Gaussian measurement noise. *IEEE Tr. Im. Proc.*, 9(6):1049–56, June 2000.
22. J. W. Stayman and J. A. Fessler. Regularization for uniform spatial resolution properties in penalized-likelihood image reconstruction. *IEEE Tr. Med. Im.*, 19(6):601–15, June 2000.
23. D. F. Yu, J. A. Fessler, and E. P. Ficaro. Maximum likelihood transmission image reconstruction for overlapping transmission beams. *IEEE Tr. Med. Im.*, 19(11):1094–1105, Nov. 2000.
24. J. Kim, J. A. Fessler, K. L. Lam, J. M. Balter, and R K Ten Haken. A feasibility study of mutual information based set-up error estimator for radiotherapy. *Med. Phys.*, 28(12):2507–17, Dec. 2001.
25. C. Comtat, P. E. Kinahan, J. A. Fessler, T. Beyer, D. W. Townsend, M. Defrise, and C. Michel. Clinically feasible reconstruction of 3d whole-body PET/CT data using blurred anatomical labels. *Phys. Med. Biol.*, 47(1):1–20, Jan. 2002.
26. I. A. Elbakri and J. A. Fessler. Statistical image reconstruction for polyenergetic X-ray computed tomography. *IEEE Tr. Med. Im.*, 21(2):89–99, Feb. 2002.
27. D. F. Yu and J. A. Fessler. Edge-preserving tomographic reconstruction with nonlocal regularization. *IEEE Tr. Med. Im.*, 21(2):159–73, Feb. 2002.
28. S. Sotthivirat and J. A. Fessler. Image recovery using partitioned-separable paraboloidal surrogate coordinate ascent algorithms. *IEEE Tr. Im. Proc.*, 11(3):306–17, Mar. 2002.
29. D. F. Yu and J. A. Fessler. Mean and variance of coincidence photon counting with deadtime. *Nucl. Instr. Meth. Phys. Res. A.*, 488(1-2):362–74, Aug. 2002.
30. S. Ahn and J. A. Fessler. Globally convergent image reconstruction for emission tomography using relaxed ordered subsets algorithms. *IEEE Trans. Med. Imag.*, 22(5):613–26, May 2003.
31. J. A. Fessler and B. P. Sutton. Nonuniform fast Fourier transforms using min-max interpolation. *IEEE Tr. Sig. Proc.*, 51(2):560–74, Feb. 2003.
32. B. P. Sutton, D. Noll, and J. A. Fessler. Fast, iterative, field-corrected image reconstruction for MRI. *IEEE Tr. Med. Im.*, 22(2):178-88, Feb. 2003.

33. J. Kim and J. A. Fessler. Intensity-based image registration using robust correlation coefficients. *IEEE Trans. Med. Imag.*, 23(11):1430–44, November 2004.
34. J. A. Fessler, S. Lee, V. T. Olafsson, H. R. Shi, and D. C. Noll. Toeplitz-based iterative image reconstruction for MRI with correction for magnetic field inhomogeneity. *IEEE Trans. Sig. Proc.*, 53(9):3393–402, September 2005.
35. C-. Yip, J. A. Fessler, and D. C. Noll. Iterative RF pulse design for multidimensional, small-tip-angle selective excitation. *Mag. Res. Med.*, 54(4):908–17, October 2005.
36. S. Ahn, J. A. Fessler, D. Blatt, and A. O. Hero. Convergent incremental optimization transfer algorithms: Application to tomography. *IEEE Trans. Med. Imag.*, 25(3):283–96, March 2006.
37. Y. Zhang-O'Connor and J. A. Fessler. Fourier-based forward and back-projectors in iterative fan-beam tomographic image reconstruction. *IEEE Trans. Med. Imag.*, 25(5):582–9, May 2006.
38. C. Yip, J. A. Fessler, and D. C. Noll. Advanced three-dimensional tailored RF pulse for signal recovery in T_2^*-weighted functional magnetic resonance imaging. *Mag. Res. Med.*, 56(5):1050–9, November 2006.
39. W. Grissom, C. Yip, Z. Zhang, V. A. Stenger, J. A. Fessler, and D. Noll. Spatial domain method for the design of RF pulses in multi-coil parallel excitation. *Mag. Res. Med.*, 56(3):620–9, September 2006.
40. R. Zeng, J. A. Fessler, and J. M. Balter. Estimating 3-D respiratory motion from orbiting views by tomographic image registration. *IEEE Trans. Med. Imag.*, 26(2):153–63, February 2007.
41. Y. Zhang-O'Connor and J. A. Fessler. Fast predictions of variance images for fan-beam transmission tomography with quadratic regularization. *IEEE Trans. Med. Imag.*, 26(3):335–46, March 2007.
42. M. W. Jacobson and J. A. Fessler. An expanded theoretical treatment of iteration-dependent majorize-minimize algorithms. *IEEE Trans. Im. Proc.*, 16(10):2411–22, October 2007.
43. J. A. Fessler. On NUFFT-based gridding for non-Cartesian MRI. *J. Mag. Res.*, 188(2):191–5, October 2007.
44. A. Yendiki and J. A. Fessler. Analysis of observer performance in unknown-location tasks for tomographic image reconstruction. *J. Opt. Soc. Am. A*, 24(12):B99–109, December 2007. Special issue on Image Quality.
45. R. Zeng, J. A. Fessler, J. M. Balter, and P. A. Balter. Iterative sorting for four-dimensional CT images based on internal anatomy motion. *Med. Phys.*, 35(3):917–26, March 2008.
46. W. A. Grissom, C. Yip, S. M. Wright, J. A. Fessler, and D. C. Noll. Additive angle method for fast large-tip-angle RF pulse design in parallel excitation. *Mag. Res. Med.*, 59(4):779–87, April 2008.
47. D. Ruan, J. A. Fessler, J. M. Balter, R. I. Berbeco, S. Nishioka, and H. Shirato. Inference of hysteretic respiratory tumour motion from external surrogates: A state augmentation approach. *Phys. Med. Biol.*, 53(11):2923–36, June 2008.
48. A. K. Funai, J. A. Fessler, D. T. B. Yeo, V. T. Olafsson, and D. C. Noll. Regularized field map estimation in MRI. *IEEE Trans. Med. Imag.*, 27(10):1484–94, October 2008.
49. J. Noh, J. A. Fessler, P. E. Kinahan, Statistical sinogram restoration in dual-energy CT for PET attenuation correction. *IEEE Trans. Med. Imag.*, to appear, 2009.

Over 140 conference proceedings papers published.
Over 140 conference abstracts published.

C. Research Support
Research projects ongoing

Title: *Automatic 3D registration for enhanced cancer management / Project 3*
Principal Investigator: Charles R. Meyer; Project 3 director: J. A. Fessler
Source: NIH/NCI 1P01 CA87634-06A2. Project Period: 01/12/09-02/28/14.

Title: *X-ray CT image reconstruction using statistical methods: 2009-10*
Principal Investigator: Jeffrey A. Fessler
Source: GE Medical Systems N004789-10. Project Period: 5/1/09-04/30/10.

Title: *Regularized reconstruction of dynamic contrast-enhanced MR images for evaluation of breast lesions*
Principal Investigator: Jeffrey A. Fessler (predoctoral fellowship for Kim Khalsa)
Source: Army W81XWH-08-1-0273. Project Period: 9/1/08-9/30/10.

Title: *UM subcontract: Quantitative PET/CT oncology imaging*
Principal Investigator: Jeffrey A. Fessler
Source: Univ. of Washington 05-5341. Project Period: 9/1/06-8/31/10.

Title: *Efficient execution of medical imaging applications on the Intel Larrabee system*
Principal Investigator: Satish Narayanasamy
Source: Intel Gift 53718. Project Period: 9/1/08 - 8/31/11.

Title: *MRI parallel excitation for neuroimaging applications*
Principal Investigator: Doug Noll
Source: NIH NS R01 NS 058576. Project Period: 01/01/08-12/31/12.

Title: *Development of real-time imaging and isotope detection algorithms for 3-D position-sensitive semiconductor gamma-ray imaging spectrometers and sensor networks*
Principal Investigator: Zhong He
Source: DNDO 2008-DN-077-ARI007-02. Project Period: 9/1/07-8/31/12.

Title: *Digital tomosynthesis mammography: Computer-aided analysis of masses*
Principal Investigator: Heang-Ping Chan
Source: NIH 1 R21 CA120234-01. Project Period: 9/1/06-8/31/09.

Title: *Optimization of high dose conformal therapy*
Principal Investigator: Benedick Fraass
Source: NIH 2 P01 CA59827-11A1. Project Period: 7/1/06-6/30/11.

Title: *SPECT/CT image-based dosimetry in radionuclide therapy*
Principal Investigator: Yuni Dewaraja
Source: NIH NCI 2 R01 EB001994-08. Project Period: 7/06/07-4/30/11.

Research projects completed during the last 3 years

Title: *X-ray CT image reconstruction using statistical methods*
Principal Investigator: Jeffrey A. Fessler
Source: GE Medical Systems N004789. Project Period: 9/1/07-12/31/08, NCX to 8/31/09.

Title: *Elimination of head movement artifact in fMRI*
Principal Investigator: Doug Noll
Source: NIH 1 R01 EB002683. Project Period: 09/01/03-7/31/08, NCX to 7/31/09.

Title: *2007 International Symposium on Biomedical Imaging (ISBI)*
Principal Investigator: Jeffrey A. Fessler
Source: NIH R13 EB007469-01. Project Period: 4/12/07-4/15/07.

Title: *X-ray CT image reconstruction using statistical methods (year 5)*
Principal Investigator: Jeffrey A. Fessler
Source: GE Medical Systems N004789. Project Period: 9/1/06-8/31/07, NCX to 2008-6-1.

Title: *Monte Carlo simulation of high energy photon imaging*
Principal Investigator: Yuni Dewaraja
Source: NIH NCI 5 R01 EB001994-07. Project Period: 7/01/03-6/30/07, NCX to 7/05/07.

Title: *X-ray CT image reconstruction using statistical methods (year 4)*
Principal Investigator: Jeffrey A. Fessler
Source: GE Medical Systems N004789. Project Period: 9/1/05-9/30/06, NCX to 6/1/07.

Title: *Signal recovery in susceptibility-based functional MRI*
Principal Investigator: Doug Noll
Source: NIH/NIDA R01 DA15410-01. Project Period: 9/10/02-6/30/07, NCX 6/30/08.

Title: *Automatic 3D registration for enhanced cancer management / Project 4*
Principal Investigator: Charles R. Meyer; Project 4 director: J. A. Fessler
Source: NIH/NCI 1P01 CA87634-01A3. Project Period: 04/01/02-03/31/07, NCX: 6/30/08.

Title: *Lung image database*
Principal Investigator: Charles R. Meyer
Source: NIH/NCI 1U01 CA91099-01. Project Period: 08/01/01-07/31/06.

Title: *Direct brain interface based on event detection in ECoG*
Principal Investigator: Simon Levine
Source: NIH/NINDS R01 EB002093. Project Period: 04/01/01-03/31/06.