

## BIOGRAPHICAL SKETCH

Name: **Jeffrey A. Fessler**

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### Professional Preparation

Institution and Location	Degree	Year	Field
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
University of Michigan, Ann Arbor, MI	Post Doc	1990-1992	Nuclear Medicine

### Appointments

07/06-08/08	Assoc. Chair, ECE Division, Dept. of Electrical Engineering and Computer Science, University of Michigan
09/04-present	Professor, Dept. of Electrical Engineering and Computer Science, Dept. of Biomedical Engineering, Dept. of Radiology, University of Michigan
09/98-08/04	Associate Professor, Dept. of Electrical Engineering and Computer Science, Dept. of Biomedical Engineering, Dept. of Radiology, University of Michigan
09/95-08/98	Assistant Professor, Dept. of Electrical Engineering and Computer Science, University of Michigan
10/97-08/99	Assistant Professor, Division of Nuclear Medicine, University of Michigan
05/93-04/98	Assistant Professor, Dept. of Biomedical Engineering, University of Michigan
04/93-08/95	Assistant Professor / Assistant Research Scientist, Division of Nuclear Medicine, University of Michigan
09/90-09/93	Post-doctoral fellow, Division of Nuclear Medicine, University of Michigan
1986-1990	Research Assistant for A. Macovski, EE Dept., Stanford University, Stanford, CA

### Relevant Publications (selected from over 110 journal papers and over 280 abstracts)

1. J. Noh, J. A. Fessler, and P. E. Kinahan. Statistical sinogram restoration in dual-energy CT for PET attenuation correction. *IEEE Trans. Med. Imag.*, 28(11):1688–702, November 2009. DOI: 10.1109/TMI.2009.2018283
2. H. R. Shi and J. A. Fessler. Quadratic regularization design for 2D CT. *IEEE Trans. Med. Imag.*, 28(5):645–56, May 2009. DOI: 10.1109/TMI.2008.2007366
3. M W Jacobson, J A Fessler. An expanded theoretical treatment of iteration-dependent majorize-minimize algorithms. *IEEE Trans. Im. Proc.*, 16(10):2411-22, Oct. 2007. DOI: 10.1109/TNS.2006.875467
4. 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. DOI: 10.1109/TMI.2005.862740
5. 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. DOI: 10.1109/83.465106

### Significant publications

1. J A Fessler. Penalized weighted least-squares image reconstruction for positron emission tomography. *IEEE Tr. Med. Im.*, 13(2):290–300, June 1994. DOI: 10.1109/42.293921
2. J A Fessler and A O Hero. Space-alternating generalized expectation-maximization algorithm. *IEEE Tr. Sig. Proc.*, 42(10):2664–77, Oct. 1994. DOI: 10.1109/78.324732
3. 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. DOI: 10.1109/83.491322
4. 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. DOI: 10.1109/83.535846

5. J. A. Fessler and B. P. Sutton. Nonuniform fast Fourier transforms using min-max interpolation. *IEEE Trans. Sig. Proc.*, 51(2):560–74, February 2003. DOI: 10.1109/TSP.2002.807005

### Synergistic Activities

- Open source Matlab image reconstruction toolbox and ASPIRE software package for tomographic image reconstruction available at <http://www.eecs.umich.edu/~fessler>
- PWLS reconstruction algorithm used routinely at UM Medical Center for cardiac SPECT scans. (Several thousand scans have been performed using this method.)
- Associate editor for IEEE Transactions on Medical Imaging. General chair of ISBI 2007.
- Short courses on image reconstruction at IEEE NSS/MIC and IEEE ISBI.
- Created “Advanced topics in image reconstruction” course (EECS 755) at University of Michigan, based on monograph on image reconstruction under development.

### Collaborators

R Ackerman (UM), A Alessio (U. Washington), J Balter (UM), T Chenevert (UM), C Comtat (Service Hospitalier Frederic Jolit Orsay), Y Dewaraja (UM), B Feng (Siemens), B Graimann (Graz), A Hero (UM), M Kessler (UM), M King (U. Mass.), J Kritzman (UM), M Ljungberg (Lunds Universitet, Sweden), M Kaminski (UM), I Kazantsev (U. Penn), R Koeppel (UM), K Koral (UM), M Kilbourn (UM), B Kim (UM), P Kinahan (U. Washington), S Levine (UM), G Lee (UM), S Levine (UM), B Ma (UM), C Meyer (UM), L Meng (U. Illinois), R Miyaoka (U. Washington), D Noll (UM), H Park (UM), V Rogers (UM), D Rugar (IBM), V Solo (Macquarie), J Sonke (Netherlands Cancer Inst.), A Stenger (Hawaii), S Wilderman (UM), J Wolthaus (Netherlands Cancer Inst.), S Wright (Texas A&M), Z Zhang (U. Pittsburgh), where UM=Univ. of Michigan.

### Advisees

#### *Dissertations chaired*

Chun, Se Young, Harvard  
Shi, Hugo, Chicago Trading Company  
Ruan, Dan, Stanford  
Srivastava, Somesh, IBM  
Zeng, Rongping, FDA  
Zhong-O’Connor, Yingying, RGM Advisors  
Jacobson, Matthew, Xoran Tech.  
Yendiki, Anastasia, Harvard  
Ahn, Sangtae, USC  
Kim, Jeongtae, Ewha Univ., Korea  
Elbakri, I, Cancer Care  
Sotthivirat, S, NSTDA, Thailand  
Stayman, J W, MTRI  
Yu, D, Univ. of Bristol  
Yavuz, M, QualComm  
Erdogan, H, Sabanci University, Turkey

#### *Dissertations co-chaired*

Maleh, Ray, L3 Communications  
Olafsson, Valur, UC San Diego  
Bashan, Eran, Hygieia, Inc.  
Bhagalia, Roshni, GE  
Joshi, Aniket, Merck  
Yeo, Teng Beck (Desmond), GE  
Way, Ted, Microsoft  
Noh, Joonki, Galt Research  
Yip, Chun-yu, Harvard  
Narayanan, Ram, Eigen  
Lee, Sangwoo, GE  
Krishnan, Sumati, UM  
Sutton, Brad, Univ. of Illinois  
Park, H, UM  
Sukovic, P, Xoran  
Ghanei, A, Medtronic  
Titus, S, Lattice Semiconductor Corp.

Currently advising a group of about 10 PhD students in EECS, BME, and Applied Physics, and co-chairing 3 other doctoral theses.

### Advisors

Graduate: A Macovski, Stanford University  
Postdoctoral: WL Rogers, University of Michigan