Ramesh Neelamani

Rice University
6100 Main St., ECE dept., MS 366
Houston TX 77005
Phone: 713 348 3230, Fax: 713 348 6196
Email: neelsh@rice.edu

Home Address
1933 Dryden Road, Apt. #2
Houston, TX 77030
Phone: 713 527 9617
Web: www.dsp.rice.edu/~neelsh

RESEARCH INTERESTS

Multimedia processing theory and applications – signal/image restoration, segmentation, halftoning, compression; multiscale representations and algorithms; color processing; pattern recognition; graphical models

EDUCATION

Ph.D., Rice University, in Electrical and Computer Engineering, July 2003 (expected)
Thesis: Inverse Problems in Image Processing. GPA: 3.96/4.00
Advisor: Prof. Richard G. Baraniuk

M.S., Rice University, in Electrical and Computer Engineering, May 1999
Thesis: Wavelet-based Deconvolution for Ill-conditioned Systems. GPA: 3.96/4.00
Advisor: Prof. Richard G. Baraniuk

B.Tech., Indian Institute of Technology – Bombay, in Electrical Engineering, July 1997
Thesis: Array Signal Processing. GPA: 8.95/10.00
Advisor: Prof. Harish Parthasarathy

HONORS

Rice Graduate Fellowship, 1997–98

Second prize in IEEE all-India student paper contest, 1995

Eta Kappa Nu Engineering Honor Society, 1998

RESEARCH EXPERIENCE

Rice University, May 1998–present
Research assistant in the Electrical and Computer Engineering Department
Designed and implemented (C, MATLAB) multiscale solutions to restoration, inverse halftoning, and segmentation with R. G. Baraniuk, R. D. Nowak, and H. Choi.
Collaborated with D. M. Mittleman to solve Terahertz imaging problems

Ricoh Innovations, Inc., May–Aug. 2001
Summer intern in the California Research Center, Menlo Park, California
Invented and implemented (MATLAB, Python) purely header-based JPEG 2000 image processing algorithms with K. Berkner, E. L. Schwartz and M. Boliek

Xerox Corporation, May–Aug. 2000
Summer intern in the Document Research Center, Webster, New York
Devised and implemented (C, MATLAB) techniques to discover an image's JPEG compression history with R. de Queiroz and Z. Fan

TEACHING EXPERIENCE

Rice University, Jan.–May 2000
Teaching Fellow for Spectral Analysis
Delivered lectures and developed new course material

Rice University, Jan. 1998–Dec. 1999
Teaching Assistant for Random Processes (3 semesters) and Circuits (2 semesters)
Organized weekly help sessions and graded student performances

PATENTS (filed)

K. Berkner, R. Neelamani, G. J. Wolff, M. Boliek, and P. E. Hart, "Creation of Visually Recognizable Display Device Dependent Small-size Representations of Images (SmartNails)," filed in Jan. 2002

K. Berkner, R. Neelamani, E. L. Schwartz, and M. Boliek, "Header-based Processing of Images Compressed using Multi-scale Transforms," filed in Jan. 2002

JOURNAL PUBLICATIONS (download: www.dsp.rice.edu/~neelsh/publications/)

Under Preparation

R. Neelamani, K. Berkner, E. L. Schwartz, and M. Boliek, "Header-based Processing of JPEG 2000 Images," for *IEEE Transactions on Image Processing*

R. Neelamani, R. de Queiroz, R. G. Baraniuk, and Z. Fan, "Compression History Estimation from Previously JPEG-compressed Color Images," for *IEEE Transactions on Image Processing*

Submitted

R. Neelamani, R. D. Nowak, and R. G. Baraniuk, "WInHD: Wavelet-based Inverse Halftoning via Deconvolution," submitted to *IEEE Transactions on Image Processing,* 2002

Accepted/Published

R. Neelamani, H. Choi, and R. G. Baraniuk, "ForWaRD: Fourier-Wavelet Regularized Deconvolution for Ill-Conditioned Systems," to appear in *IEEE Transactions on Signal Processing,* 2003.

D. M. Mittleman, M. Gupta, R. Neelamani, R. G. Baraniuk, J. V. Rudd, and M. Koch, "Recent Advances in Terahertz Imaging," *Applied Physics B*, vol. 68, pp. 1085–1094, 1999

D. M. Mittleman, R. H. Jacobsen, R. Neelamani, R. G. Baraniuk, and M. C. Nuss, "Gas Sensing using Terahertz Time-domain Spectroscopy," *Applied Physics B*, vol. 67, no. 3, pp. 379–390, 1998

R. Neelamani and D. Iyer, "Spectral Performance of GMSK: Effects of Modulation Index and Quantization," *IETE Students' Journal*, vol. 37, no. 4, pp. 231–236, Oct. 1996

CONFERENCE PUBLICATIONS (download: www.dsp.rice.edu/~neelsh/publications/)

R. Neelamani, and K. Berkner, "Adaptive Representation of JPEG 2000 Images using Header-based Processing," *Proc. IEEE Int. Conf. on Image Processing – ICIP 2002*, Rochester, NY, Sept. 2002

R. Neelamani, R. de Queiroz, and R. G. Baraniuk, "Compression Color Space Estimation of JPEG Images using Lattice Basis Reduction," *Proc. IEEE Int. Conf. on Image Processing – ICIP 2001*, vol. 1, pp. 890–893, Thessaloniki, Greece, Sept. 2001

R. Neelamani, R. de Queiroz, and R. G. Baraniuk, “Lattice Algorithms for Compression Color Space Estimation in JPEG Images,” *8th Int. Workshop on Combinatorial Image Analysis – IWCIA 2001*, Philadelphia, Aug. 2001. Published in Electronic Notes in Theoretical Comp. Sci., vol. 46

R. Neelamani, R. D. Nowak, and R. G. Baraniuk, “Model-based Inverse Halftoning with Wavelet-Vaguelette Deconvolution,” *Proc. IEEE Int. Conf. on Image Processing – ICIP 2000*, vol. 3, pp. 973–976, Vancouver, Canada, Sept. 2000

R. Neelamani, J. K. Romberg, R. H. Riedi, H. Choi, and R. G. Baraniuk, “Multiscale Image Segmentation using Joint Texture and Shape Analysis,” *Wavelet Applications in Signal and Image Processing VIII, Proc. SPIE*, vol. 4119, pp. 215–228, San Diego, July 2000 (invited paper)

R. Neelamani, H. Choi, and R. G. Baraniuk, “Wavelet-domain Regularized Deconvolution for Ill-conditioned Systems,” *Proc. IEEE Int. Conf. on Image Processing – ICIP 1999*, vol. 1, pp. 204–208, Kobe, Japan, Oct. 1999

R. Neelamani, H. Choi, and R. G. Baraniuk, “Wavelet-based Deconvolution using Optimally Regularized Inversion for Ill-conditioned Systems,” *Wavelet Applications in Signal and Image Processing VII, Proc. SPIE*, vol. 3813, pp. 58–72, Denver, July 1999 (invited paper)

R. Neelamani, H. Choi, and R. G. Baraniuk, “Wavelet-based Deconvolution for Ill-conditioned Systems,” *Proc. IEEE Conf. on Acoustics, Speech, and Signal Processing – ICASSP 1998*, vol. 6, pp. 3241–3244, Phoenix, AZ, March 1999

D. M. Mittleman, R. Neelamani, M. Gupta, R. G. Baraniuk, and M. C. Nuss, “Recent Advances in Imaging and Spectroscopy with T-rays,” *Proc. IEEE Int. Conf. on Lasers 1998*, Tucson, AZ, Dec. 1998

D. M. Mittleman, R. Neelamani, R. G. Baraniuk, and M. C. Nuss, “Applications of Tera-Hertz Imaging,” *Proc. IEEE-OSA Topical Meeting on Nonlinear Optics*, pp. 294–296, Kauai, Hawaii, Aug. 1998

INVITED PRESENTATIONS

“One Hammer, Two Nails: Wavelet-based Solutions to Deconvolution and Inverse Halftoning,” LCAV seminar, École Polytechnique Fédérale de Lausanne, Switzerland, Apr. 2002

“Multiscale Image Segmentation,” Document Research Center, Xerox Corporation, Webster, NY, July 2000

“Wavelet-based Deconvolution for Ill-conditioned Systems,” *Texas Instruments DSP Leadership Meeting*, Dallas, Texas, May 1999

PROFESSIONAL ACTIVITIES

Reviewer for IEEE, IEE, and JEI journals

IEEE student member

ADVANCED COURSE WORK

Digital signal processing	Detection theory	Random processes	Spectral analysis
Wireless communications	Information theory	Networks	Algorithms
Real analysis	Measure theory	Functional analysis	Fractals

COMPUTER SKILLS

Systems	UNIX/Linux, Windows
Languages/Packages	MATLAB, C/C++, Mathematica, Maple, Python

–References available on request–