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EDUCATION

Ph.D., Electrical Engineering, Georgia Institute of Technology, Atlanta, GA, 1995 (GPA: 4.0).
M.S., Electrical Engineering, Georgia Institute of Technology, Atlanta, GA, 1992 (GPA: 4.0).
B. E., Computer and Communications Engineering, American University of Beirut, Beirut, Lebanon, 1989 (1st in class).

ACADEMIC EXPERIENCE

Associate Professor (August 2001 – Present), Department of Electrical, Computer, and Energy Engineering (formerly known as Department of Electrical Engineering), Arizona State University, Tempe, AZ.

Visiting Associate Professor (August 2005 – December 2005), Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX.

Assistant Professor (August 1995 – August 2001), Department of Electrical Engineering, Arizona State University, Tempe, AZ.

Research Assistant (September 1992 – June 1995), School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA.

Research Assistant (June 1991 – September 1992), Graphics, Visualization, and Usability (GVU) Center, Georgia Institute of Technology, Atlanta, GA.

Research Assistant (February 1990 - June 1991), Scientific Visualization Group, Georgia Institute of Technology, Atlanta, GA.

PRINCIPLE AREAS OF RESEARCH AND TEACHING

My principle area of research is **digital image and video processing**, specifically it includes:

- Digital image and video compression
- Perceptual-based visual processing and coding
- Visual quality assessment
- Digital image and video segmentation
- Digital image and video enhancement and restoration
- Biomedical imaging
- Source coding
- Joint source channel coding
- Digital filtering

BOOKS

Note: Student authors are shown in boldface.

1. Lina J. Karam and **Naji Mounsef**, *Introduction to Engineering: A Starter's Guide With Hands-On Digital Multimedia Explorations and Robotics*, Morgan-Claypool, 2008.
2. Lina J. Karam and **Naji Mounsef**, *Introduction to Engineering: A Starter's Guide With Hands-On Analog Multimedia Explorations*, Morgan-Claypool, 2008.

BOOK CHAPTERS

1. Lina J. Karam, "Lossless Image Compression," in *The Essential Guide to Image Processing*, Al Bovik Editor, Chapter 16, pages 385-417, Elsevier Academic Press, 2009.
2. Lina J. Karam, "Lossless Coding", in *the Handbook of Image and Video Processing*, 2nd Edition, Al Bovik Editor, Chapter 5.1, pages 643-660, Elsevier Academic Press, 2005.
3. Umesh Rajashekar, Alan C. Bovik, Daniel Sage, Michael Unser, Lina J. Karam, and Reginald Lagendijk, "Image Processing Education," in *the Handbook of Image and Video Processing*, 2nd Edition, Al Bovik Editor, Chapter 2.4, pages 73-95, Elsevier Academic Press, 2005.
4. Lina J. Karam, "Lossless Image Coding," in *the Handbook of Image & Video Processing* Al Bovik, Editor, Chapter 5.1, pages 461-474, Academic Press, 2000.
5. Lina J. Karam, James H. McClellan, Ivan Selesnick, and C. Sidney Burrus, "Digital Filtering," in *the Digital Signal Processing Handbook* (V. K. Madisetti and D. B. Williams, Editors), Chapter 11, pages 11-1 to 11-86, CRC Press, 1998.

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Citations included for some selected papers based on Google Scholar.

1. **Ismail AlKamal**, Alan Gatherer, Lina J. Karam, Gene Frantz, David Anderson, and Brian Evans, "Trends in Multi-Core DSP Platforms," accepted for publication in the *IEEE Signal Processing Magazine, Special Issue on Signal Processing on Platforms with Multiple Cores*, July 2009 (acceptance notification date).
2. **Wei-Jung Chien** and Lina J. Karam, "Transform-Domain Distributed Video Coding with Rate-Distortion Based Adaptive Quantization," accepted for publication in the *IET Image Processing Journal, Special Issue on Distributed Video Coding*, July 2009 (acceptance notification date).
3. **Wei-Jung Chien** and Lina J. Karam, "BLAST-DVC: BitpLane SelecTive Distributed Video Coding," *Springer Multimedia Tools and Applications Journal, Special Issue on Distributed Video Coding*, July 2009, DOI 10.1007/s11042-009-0314-8.
4. Lina J. Karam, Touradj Ebrahimi, Sheila Hemami, Thrasos Pappas, Robert Safranek, Zhou Wang, and Andrew B. Watson, "Introduction to the Special Issue on Visual Media Quality Assessment," *IEEE Journal on Special Topics in Signal Processing, Special Issue on Visual Media Quality Assessment*, vol. 3, no. 2, pp. 189-192, April 2009.
5. **Rony Ferzli** and Lina J. Karam, "A No-Reference Objective Image Sharpness Metric Based on the Notion of Just Noticeable Blur (JNB)," *IEEE Transactions on Image Processing*, vol. 18, no. 4, pp. 717-728, April 2009.
6. **Brian Lenoski**, Leslie C. Baxter, Lina J. Karam, José Maisog, and Josef Debbins, "On the Performance of Autocorrelation Estimation Algorithms for fMRI Analysis," *IEEE Journal on Special Topics in Signal Processing, Special Issue on Functional Magnetic Resonance Imaging*, vol. 2, no. 6, pp. 828-838, Dec. 2008.
7. **Geert Van der Auwera**, **Prasanth T. David**, Martin Reisslein, and Lina J. Karam, "Traffic and Quality Characterization of the H.264/AVC Scalable Video Coding Extension," *Advances in Multimedia*, vol. 2008, Article ID 164027, 27 pages, 2008. doi:10.1155/2008/164027.
8. Andrew B. Watson, **Zhen Liu**, and Lina J. Karam, "JPEG2000 Encoding with Perceptual Distortion Control," *NASA Tech Brief*, pp. 37-38, Sep. 2008.
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10. Lina J. Karam and **Tuyet-Trang Lam**, "Selective Error Detection for Error-Resilient Wavelet-Based Image Coding," *IEEE Transactions on Image Processing*, vol. 16, no. 12, pp. 2936-2942, Dec. 2007.
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12. **Geert Van der Auwera**, Martin Reisslein, and Lina J. Karam, "Video Texture and Motion Based Modeling of Rate Variability-Distortion (VD) Curves," *IEEE Transactions on Broadcasting*, vol. 53, no. 3, pp. 637-648, Sept. 2007.
13. **Zhen Liu**, Lina J. Karam, and Andrew B. Watson, "JPEG2000 Encoding with Perceptual Distortion Control," *IEEE Transactions on Image Processing*, vol. 15, no. 7, pp. 1763-1778, Jul. 2006. [15 Citations]
14. **Zhen Liu** and Lina J. Karam, "Mutual Information-Based Analysis of JPEG2000 Contexts," *IEEE Transactions on Image Processing*, vol. 14, no. 4, pp. 411-422, April 2005. [14 Citations]
15. Glen P. Abousleman, **Tuyet-Trang Lam**, and Lina J. Karam, "Robust Hyperspectral Image Coding with Channel-Optimized Trellis-Coded Quantization," *IEEE Transactions on Geoscience and Remote Sensing*, vol 40, no. 4, pp. 820-830, April 2002. [13 Citations]
16. **Ingo Höntsch** and Lina J. Karam, "Adaptive Image Coding with Perceptual Distortion Control," *IEEE Transactions on Image Processing*, vol. 11, no. 3, pp. 213-222, March 2002. [31 Citations]
17. **M. Yassin Hasan**, Lina J. Karam, Matt Falkinburg, Art Helwig, and Matt Ronning, "Canonic Signed Digit Digital Filter Design," *IEEE Signal Processing Letters*, vol. 8, pp. 167-169, June 2001.
18. **M. Yassin Hasan** and Lina J. Karam, "Morphological Text Extraction from Images," *IEEE Transactions on Image Processing*, vol. 9, pp. 1978-1983, Nov. 2000. [56 Citations]
19. **Ingo Höntsch** and Lina J. Karam, "Locally Adaptive Perceptual Image Coding," *IEEE Transactions on Image Processing*, vol. 9, pages 1472-1483, Sept. 2000. [48 Citations]
20. **Tuyet-Trang Lam**, Glen P. Abousleman, and Lina J. Karam, "Image Coding with Robust Channel-Optimized Trellis-Coded Quantization," *IEEE Journal on Selected Areas in Communications, Special Issue on Error-Resilient Image and Video Transmission*, vol. 18, pp. 940-951, June 2000. [25 Citations]
21. **Francescomaria Marino**, Tinku Acharya, and Lina J. Karam, "A DWT-Based Perceptually Lossless Compression Scheme and VLSI Architecture for R-G-B Digital Images," *Journal of Integrated Computer-Aided Engineering*, vol. 7, pp. 117-134, 2000.

22. **M. Yassin Hasan** and Lina J. Karam, "Morphological Reversible Contour Representation," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 22, pp. 227-240, March 2000. [20 Citations]
23. Lina J. Karam and James H. McClellan, "Chebyshev Digital FIR Filter Design," *Signal Processing*, vol. 76, pages 17-36, July 1999. [12 Citations]
24. Lina J. Karam, "Two-Dimensional FIR Filter Design by Transformation," *IEEE Transactions on Signal Processing*, vol. 47, pp. 1474-1478, May 1999.
25. Lina J. Karam and James H. McClellan, "Efficient Design of Digital Filters for 2-D and 3-D Depth Migration," *IEEE Transactions on Signal Processing*, vol. 45, pp. 1036-1044, April 1997.
26. Lina J. Karam and James H. McClellan, "Complex Chebyshev Approximation for FIR Digital Filter Design," *IEEE Transactions on Circuits and Systems II*, vol. 42, pp. 207-216, March 1995. [77 Citations]
27. Brian L. Evans, Lina J. Karam, Kevin A. West, and James H. McClellan, "Learning Signals and Systems with Mathematica," *IEEE Transactions on Education*, vol. 36, pp. 72-78, Feb. 1993. [20 Citations]

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28. Lina J. Karam, "Video Quality for Communications," *IEEE COMSOC MMTTC E-Letter*, vol. 4, no. 4, pp. 15-16, May 2009. Invited.

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29. **Asaad F. Said**, Bonnie L. Bennett, Lina J. Karam, and Jeff Pettinato, “Automated Detection and Classification of Non-Wet Solder Joints,” submitted to the *IEEE Transactions on Automation Science and Engineering, Special Issue on Equipment and Operations Automation in the Semiconductor Industry*, June 2009.
30. **Rony Ferzli**, **Zoran Ivanovski**, Lina J. Karam, and **Nabil Sadaka**, “Perceptual Selective Super-Resolution,” to be submitted to the *IEEE Transactions on Image Processing*, July-August 2009.
31. **Asaad F. Said**, Lina J. Karam, and Michael E. Berens, “Automatic Cell Migration and Proliferation Analysis,” to be submitted to the *IEEE Transactions on Medical Imaging*, July-August 2009.
32. Lina J. Karam, “Multidimensional FIR Digital Filters,” to be submitted to the *Journal on Foundations and Trends in Signal Processing* (Robert Gray, Editor), July-August 2009. Invited.
33. **Jinane Mounsef**, Lina J. Karam, and Daniela Zarnescu, “Automatic Shape Analysis and Classification of LGL-Type and W-Type Neurons,” in preparation.
34. **Berkay Kanberoglu**, Nina Zobenica, Roby Ryan, Lina J. Karam, Mark Preul, Josef P. Debbins, “A New Methodology for Spectroscopy Guided Biopsy,” in preparation.
35. **Akshay Pulipaka**, Patrick Seeling, Martin Reisslein, and Lina J. Karam, “Overview, Trace Generation and Analysis of Coarse-Grain Quality Scalable (CGS) Coding in the SVC Extension of the H.264/AVC Standard,” in preparation.
36. **Rohan Gupta**, Patrick Seeling, Martin Reisslein, and Lina J. Karam, “Trace Generation and Analysis of Medium-Grain Quality Scalable (MGS) Coding in H.264/SVC,” in preparation.
37. **Naji Mounsef**, Lina J. Karam, Zoé Lacroix, and Christophe Legendre, “Probabilistic Genome Assembly,” in preparation.

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2. **Wei-Jung Chien** and Lina J. Karam, "AQT-DVC: Adaptive Quantization for Transform-Domain Distributed Video Coding," accepted to the *IEEE International Conference on Image Processing*, Nov. 2009.
3. **Nabil Sadaka** and Lina J. Karam, "Efficient Perceptual Attentive Super-Resolution," accepted to the *IEEE International Conference on Image Processing*, Nov. 2009.
4. **Niranjan D. Narvekar** and Lina J. Karam, "A No Reference Perceptual Image Sharpness Metric Based on a Cumulative Probability of Blur Detection," *International Workshop on Quality of Multimedia Experience (QoMEX)*, July 2009.
5. **Berkay Kanberoglu**, Ted Trouard, Lina Karam, and Josef P. Debbins, "Scanner Calibration For Multisite Geometric Accuracy: How To Do It," 17th Annual ISMRM meeting, Apr. 2009.
6. **Berkay Kanberoglu**, N. Zobenica, R. Ryan, M. C. Preul, Lina J. Karam, and Josef P. Debbins, "Accurate Brain Tumor Biopsy using 3D ¹H-MRS Neuronavigation," 17th Annual ISMRM meeting, Apr. 2009.
7. **Chu-Yu Lee**, Lina J. Karam, and Josef P. Debbins, "High-Order Diffusion Imaging Used to Differentiate Cytotoxic and Vasogenic Edema in Humans," 17th Annual ISMRM meeting, Apr. 2009.
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9. **Niranjan D. Narvekar, Wei-Jung Chien, Nabil G. Sadaka**, Glen P. Abousleman, and Lina J. Karam, "Deghosting based on In-Loop Selective Filtering using Motion Vector Information for Low-Bit-Rate-Video Coding," Proc. SPIE 7351, *Mobile Multimedia/Image Processing, Security, and Applications, SPIE Symposium on Defense & Security*, pages 735107-1 to 735107-8, Apr. 2009.
10. **Srenivas Varadarajan**, Lina J. Karam, and Dinei Florencio, "Background Recovery from Video Sequences using Motion Parameters," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pages 989-992, Apr. 2009.

11. **Nabil G. Sadaka** and Lina J. Karam, "Perceptual Attentive Super-Resolution," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM)*, Jan. 2009.
12. **Niranjan D. Narvekar** and Lina J. Karam, "An Iterative Deblurring Algorithm based on the Concept of Just Noticeable Blur," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM)*, Jan. 2009.
13. **Asaad Said** and Lina J. Karam, "Multi-Region Texture Image Segmentation based on Constrained Level-Set Evolution Functions," pages 664-668, *IEEE Digital Signal Processing Workshop*, Jan. 2009.
14. **Wei-Jung Chien** and Lina J. Karam, "Bitplane Selective Distributed Video Coding," *IEEE Asilomar Conference on Signals, Systems, and Computers*, pages 2238-2242, Nov. 2008.
15. **Nabil Sadaka**, Lina J. Karam, **Rony Ferzli**, and Glen P. Abousleman, "A No-Reference Perceptual Image Sharpness Metric Based on Saliency-Weighted Foveal Pooling," *IEEE International Conference on Image Processing (ICIP)*, Oct. 2008.
16. **Srenivas Varadarajan** and Lina J. Karam, "An Improved Perception-Based No-Reference Objective Image Sharpness Metric Using Iterative Edge Refinement," *IEEE International Conference on Image Processing (ICIP)*, Oct. 2008.
17. **Rony Ferzli**, **Zoran Ivanovski**, and Lina J. Karam, "An Efficient, Selective, Perceptual-Based Super-Resolution Estimator," *IEEE International Conference on Image Processing (ICIP)*, pages 1260-1263, Oct. 2008.
18. **Wei-Jung Chien**, Lina J. Karam, and Glen P. Abousleman, "Rate-Distortion Based Selective Decoding for Pixel-Domain Distributed Video Coding," *IEEE International Conference on Image Processing (ICIP)*, Oct. 2008.
19. **Naji Mounsef**, Lina J. Karam, Zoé Lacroix, and Christophe Legendre, "A Low-Complexity Probabilistic Genome Assembly Based on Hashing," *IEEE International Workshop on Genomic Signal Processing and Statistics (GENSiPS)*, pages 1-4, June 2008.
20. **Wei-Jung Chien**, **Nabil G. Sadaka**, Glen P. Abousleman, and Lina J. Karam, "Region-of-Interest-Based Ultra-Low-Bit-Rate Video Coding," *Proc. SPIE vol. 6978, Visual Information Processing XVII, SPIE Symposium on Defense & Security*, pages 69780C-1 to 69780C-9, Mar. 2008.
21. **Asaad Said** and Lina J. Karam, "Cell Migration Analysis using a Statistical Level-Set Segmentation on a Wavelet-Based Structure Tensor Feature Space," *7th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT)*, pages 473-478, Dec. 2007.

22. **Brian Lenoski**, Lina Karam, Josef Debbins, and Leslie Baxter, "Autocorrelation Correction Methods in Clinical fMRI: Fixed Versus Variable P-Value Thresholding of 3T fMRI Datasets," *13th Annual Meeting Human Brain Mapping*, Chicago, IL, Jun. 2007.
23. **Nabil G. Sadaka**, Glen P. Abousleman, and Lina J. Karam, "Memory-Efficient Contour-based Region-of-Interest Coding of Arbitrarily Large Images," Proc. SPIE 6579, *Mobile Multimedia/Image Processing for Military and Security Applications, SPIE Symposium on Defense & Security 2007*, pages 657903-1 to 657903-10, May 2007.
24. **Wei-Jung Chien**, Glen P. Abousleman, and Lina J. Karam, "Super-resolution-based Enhancement for Real-Time Ultra-Low-Bit-Rate Video Coding," Proc. SPIE 6579, *Mobile Multimedia/Image Processing for Military and Security Applications, SPIE Symposium on Defense & Security 2007*, pages 657904-1 to 657904-9, Orlando, FL, May 2007.
25. **Brian Lenoski**, Lina Karam, Leslie Baxter, and Josef Debbins, "Clinical Significance of Global versus Local fMRI Autocorrelation Estimation," *Joint Annual Meeting ISMRM-ESMRMB*, Berlin, Germany, May 2007.
26. **Rony Ferzli** and Lina J. Karam, "A No-Reference Objective Image Sharpness Metric Based on Just-Noticeable Blur and Probability Summation," *IEEE International Conference on Image Processing (ICIP)*, vol. 3, pages 445-448, San Antonio, TX, Sep. 2007.
27. **Houssam Abbas** and Lina J. Karam, "Suppression of Mosquito Noise by Recursive Epsilon-Filters," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 1, pages 773-776, Honolulu, Hawaii, Apr. 2007.
28. **Wei-Jung Chien**, Lina J. Karam, and Glen P. Abousleman, "Block-Adaptive Wyner-Ziv Coding for Transform-Domain Distributed Video Coding," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 1, pages 525-528, Honolulu, Hawaii, Apr. 2007.
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35. **Rony Ferzli** and Lina J. Karam, "An Online Web-Based Real-Time Digital Signal Processing Course," *IEEE Frontiers in Education Conference (FIE)*, pages 6-11, San Diego, CA, Oct. 2006.
36. **Rony Ferzli** and Lina J. Karam, "A Human Visual System-Based No-Reference Objective Image Sharpness Metric," *IEEE International Conference on Image Processing*, pages 2949-2952, Oct. 2006.
37. **Rony Ferzli**, Rida A. Bazzi, and Lina J. Karam, "A CAPTCHA Based on the Human Visual System Masking Characteristics," *IEEE International Conference on Multimedia & Expo (ICME)*, pages 517-520, July 2006 (invited paper).
38. **Geert Van der Auwera**, Martin Reisslein, and Lina J. Karam, "Video Texture and Motion Based Modeling of Rate Variability-Distortion (VD) Curves of I, P, and B Frames," *IEEE International Conference on Multimedia & Expo (ICME)*, pages 1405-1408, July 2006.
39. **Wei-Jung Chien**, Lina J. Karam, and Glen P. Abousleman, "Distributed Video Coding With Lossy Side Information," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 2, pages 69-72, May 2006.
40. **Tuyet-Trang Lam**, Lina J. Karam, and Glen P. Abousleman, "Selective Error Detection for Error-Resilient JPEG2000 Coding," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 2, pages 469-472, May 2006.
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63. **Zhen Liu** and Lina J. Karam, "Quantifying the Intra and Inter Subband Correlations in the Zerotree-Based Wavelet Image Coders," *Thirty-Sixth Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1730-1734, Nov. 2002.
64. **Zhen Liu** and Lina J. Karam, "An End-to-End, Real-Time, CDPD Wireless Video Coding and Transmission System," *Thirty-Sixth Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1875-1879, Nov., 2002.
65. Andreas Spanias, **Venkatraman Atti**, **Youngwook Ko**, **Thrasos Trasyvoulou**, **Muhammad Yasin**, **Moushumi Zaman**, Tolga Duman, Lina Karam, Antonia Papandreou, Kostas Tsakalis, "On-Line Laboratories For Speech And Image Processing And For Communication Systems Using J-DSP," *IEEE Signal Processing Education Workshop*, pages 174-179, Oct. 2002.
66. **Zhen Liu** and Lina J. Karam, "Optimal Context Formation by Mutual Information Maximization," *IEEE International Conference on Image Processing*, vol. 3, pages 89-92, Sep. 2002.
67. **Lei Gao**, Lina J. Karam, Martin Reisslein, and Glen P. Abousleman, "Error-Resilient Image Coding and Transmission over Wireless Channels," *IEEE International Conference on Circuits and Systems*, vol. 5, pages 629-632, May 2002.
68. **David Giguet**, Glen P. Abousleman, and Lina J. Karam, "Very Low Bit-Rate Target-Based Image Coding," *Thirty-Fifth Asilomar Conference on Signals, Systems, and Computers*, vol. 1, pages 778-782, Oct./Nov., 2001.
69. **David Giguet**, Lina J. Karam, and Glen P. Abousleman, "Image Coding with Channel-Optimized Trellis-Coded Quantization for Channels with Memory," *Thirty-Fifth Asilomar Conference on Signals, Systems, and Computers*, vol. 1, pages 788-791, Oct./Nov., 2001.
70. **Sumohana S. Channappayya**, Glen P. Abousleman, and Lina J. Karam, "Image Coding for Transmission over Multiple Noisy Channels using Punctured Convolutional Codes and Trellis Coded Quantization," *IEEE International Conference on Image Processing*, vol. 1, pages 106-109, Oct. 2001.
71. **Sumohana S. Channappayya**, Glen P. Abousleman, and Lina J. Karam, "Coding of Digital Imagery for Transmission over Multiple Noisy Channels," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 3, pages 1729-1732, May 2001.

72. **Sumohana S. Channappayya**, Glen P. Abousleman, and Lina J. Karam, "Joint Source-Channel Coding of Images using Punctured Convolutional Codes and Trellis-Coded Quantization," *IEEE International Symposium on Circuits and Systems*, vol. 5, pages 133-136, May 2001.
73. **David Giguet**, Glen P. Abousleman, and Lina J. Karam, "Image Coding over Noisy Channels with Memory," *Proceedings of the SPIE, Aerosense, Wavelet Applications VIII*, vol. 4391, pages 181-190, March 2001.
74. **Zhen Liu**, Lina J. Karam, Glen P. Abousleman, Thomas Key, and Bassem Razzouk, "Error-Resilient Video Coding and Application to Telemedicine," *7th IEEE International Conference on Electronics, Circuits, and Systems (ICECS 2000)*, vol. 1, pages 533-536, Dec. 2000.
75. **Yassin M. Hasan**, Lina J. Karam, Matt Falkinburg, Art Helwig, and Matt Ronning, "Canonic Signed Digit FIR Filter Design," *Thirty-Fourth Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1653-1656, Oct./Nov. 2000.
76. **David Giguet**, Glen P. Abousleman, and Lina J. Karam, "Channel-Optimized Trellis-Coded Quantization over Channels with Memory," *Thirty-Fourth Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1087-1091. Oct./Nov. 2000.
77. **Zhen Liu**, Glen P. Abousleman, and Lina J. Karam, "Error-Robust Video Coding with Channel-Optimized Trellis-Coded Quantization," *Thirty-Fourth Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1389-1393, Oct./Nov. 2000.
78. **Gamal Fahmy** and Lina J. Karam, "Prediction of the Quality of JPEG-compressed Color Images Based on the SCIELAB Metric," *Thirty-Fourth Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1054-1057, Oct./Nov. 2000.
79. Lina J. Karam, "Teaching Image Processing to High School Students," *IEEE Signal Processing Education Workshop*, Oct. 2000.
On-line proceedings <http://spib.rice.edu/DSP2000/program.html#dspcourse>.
80. **Zhen Liu** and Lina J. Karam, "An Efficient Embedded Zerotree Wavelet Image Codec Based on Intra-band Partitioning," *IEEE International Conference on Image Processing*, vol. 3, pages 162-165, September 2000.
81. **Zhen Liu**, Glen P. Abousleman, and Lina J. Karam, "Error-Resilient Video Coding with Channel-Optimized Trellis-Coded Quantization," *IEEE Wireless Communications and Networking Conference*, vol. 1, pages 202-206, Oct. 2000.
82. **Tuyet-Trang Lam**, Glen P. Abousleman, and Lina J. Karam, "Multiple Description Channel-Optimized Trellis-Coded Quantization," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 5, pages 2645-2648, 2000.

83. Lina J. Karam and **David Rice**, "Web-based Interactive Tutorial for Teaching the Theory of 2-D Signals and Systems," *American Society for Engineering Education, Pacific Southwest Section Conference*, pages 77-84, 2000.
84. **Tuyet-Trang Lam**, Lina J. Karam, and Glen P. Abosuleman, "Robust Image Coding Using Perceptually-Tuned Channel-Optimized Trellis-Coded Quantization," *42nd Midwest Symposium on Circuits and Systems*, vol. 2, pages 1131-1134, 2000.
85. **Ingo Hontsch** and Lina J. Karam, "Scalable, Subband-Based Video Coding with a Locally-Adaptive Perceptual Distortion Measure," *Thirty-Three Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 1453-1457, 1999.
86. Glen P. Abosuleman, **Tuyet-Trang Lam**, and Lina J. Karam, "Channel-Optimized Hyperspectral Image Coding," *Proceedings of the SPIE, Aerosense, Algorithms for Multispectral and Hyperspectral Imagery*, vol. 3717, pages 92-103, 1999.
87. Glen P. Abosuleman, **Tuyet-Trang Lam**, and Lina J. Karam, "Channel-Optimized Transform Coding of Imagery," *Proceedings of the SPIE, Aerosense, Visual Information Processing VIII*, vol. 3716, pages 80-90, 1999.
88. Glen P. Abosuleman, **Tuyet-Trang Lam**, and Lina J. Karam, "Wavelet-Based Secure Image Coding Using Channel-Optimized Trellis-Coded Quantization," *Proceedings of the SPIE, Aerosense, Sensors, C31, Information, and Training Technologies for Law Enforcement*, vol. 3577, pages 288-299, 1999.
89. **Tuyet-Trang Lam**, Glen P. Abosuleman, and Lina J. Karam, "A Perceptually Tuned Image Coder with Channel-Optimized Trellis-Coded Quantization," *IEEE International Conference on Image Processing*, vol. 1, pages 421-425, 1999.
90. **Tuyet-Trang Lam**, Glen P. Abosuleman, and Lina J. Karam, "Wavelet-Based Image Coder with Channel-Optimized Trellis-Coded Quantization," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 6, pages 3201-3204, 1999.
91. **Francescomaria Marino**, Tinku Acharya, and Lina J. Karam, "A DWT-Based Perceptually Lossless Color Image Compression Architecture," *Thirty-Second Asilomar Conference on Signals, Systems, and Computers*, vol. 1, pages 149-153, Nov. 1998.
92. **Francescomaria Marino**, Tinku Acharya, and Lina J. Karam, "A Perceptually Lossless Compression for RGB Images," *IASTED International Conference on Signal and Image Processing*, pages 169-172, Oct. 1998.
93. **Ingo Hontsch** and Lina J. Karam, "Locally-Adaptive Image Coding Based on a Perceptual Target Distortion," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 5, pages 2569-2572, May 1998.

94. **José G. Gonzalez**, Mark J.T. Smith, **Ingo Hontsch**, Lina Karam, Kamesh Namuduri, and Harold Szu, "Perceptual Image Compression for Data Transmission on the Battlefield," *SPIE Symposium on Aerospace/Defense Sensing, Simulation, and Controls -- AeroSense'98*, vol. 3387, pages 56-67, Apr. 1998.
95. **Salvatore Bellofiore**, Lina J. Karam, Werner Metz, and Tinku Acharya, "A Flexible and User-Friendly Image Quality Assessment System," *IASTED International Conference on Signal and Image Processing*, pages 51-54, Dec. 1997.
96. **Ingo S. Hontsch** and Lina J. Karam, "Locally Adaptive Perceptual Quantization without Side Information for DCT Coefficients," *Thirty-First Asilomar Conference on Signals, Systems, and Computers*, vol. 2, pages 995-999, Nov. 1997.
97. **John Black** and Lina J. Karam, "Automatic Detection and Extraction of Perceptually Significant Features Based on Properties of Human Visual Perception," *Thirty-First Asilomar Conference on Signals, Systems, and Computers*, vol. 1, pages 315-319, Nov. 1997.
98. **Ingo S. Hontsch** and Lina J. Karam, "Locally Adaptive Perceptual Quantization without Side Information for Compression of Visual Data," *IEEE Globecom*, vol. 2, pages 1042-1046, 1997.
99. **Ingo S. Hontsch** and Lina J. Karam, "APIC: Adaptive Perceptual Image Coding Based on Subband Decomposition with Locally Adaptive Perceptual Weighting," *1997 IEEE International Conference on Image Processing*, vol. 1, pages 37-40, Oct. 1997.
100. **Ingo S. Hontsch**, Lina J. Karam, and Robert J. Safranek, "A Perceptually Tuned Embedded Zerotree Image Coder Based on Set Partitioning," *1997 IEEE International Conference on Image Processing*, vol. 1, pages 41-44, Oct. 1997.
101. Lina J. Karam, "On the Design of Multidimensional FIR Filters by Transformation," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 3, pages 2157-2160, April 1997.
102. Lina J. Karam, "Design of Complex Multi-dimensional FIR Filters by Transformation," *IEEE International Conference on Image Processing*, vol. 1, pp. 573--576, September 1996.
103. Lina J. Karam and James H. McClellan, "Efficient Design of Families of FIR Filters by Transformation," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 3, pages 359-1362, May 1996.
104. Lina J. Karam and James H. McClellan, "Design of Optimal Digital FIR Filters with Arbitrary Magnitude and Phase Responses," *IEEE International Symposium on Circuits and Systems*, vol. 2, pages 385-388, May 1996.

105. Anush Yardim, Lina J. Karam, James H. McClellan, and Gerry D. Cain, "Performance of Complex Chebyshev Approximation in Delay-Root-Nyquist Filter Design," *IEEE International Symposium on Circuits and Systems*, vol. 2, pages 169-172, May 1996.
106. Lina J. Karam and Christine Podilchuk, "Chroma Coding for Video at Very Low Bit Rates," *IEEE International Conference on Image Processing*, vol. 1, pages 562-565, October 1995.
107. Lina J. Karam and James H. McClellan, "A Multiple Exchange Remez Algorithm for Complex FIR Filter Design in the Chebyshev Sense," *IEEE International Symposium on Circuits and Systems*, vol. 2, pages 517-520, May--June 1994.
108. Lina J. Karam and James H. McClellan, "A Combined Ascent-descent Algorithm for Complex Chebyshev FIR Filter Design," *28th Annual Princeton Conference on Information Science and Systems*, March 1994.
109. Lina J. Karam, "An Analysis/Synthesis Model for the Human Visual System Based on Subspace Decomposition and Multirate Filter Bank Theory," *IEEE International Symposium on Time-Frequency and Time-Scale Analysis*, pages 559-562, October 1992.

PATENTS

Note: Student authors are shown in boldface.

1. Tinku Acharya, Lina J. Karam, and **Francescomaria Marino**, "The Compression of Color Images Based on a 2-Dimensional Discrete Wavelet Transform Yielding a Perceptually Lossless Image," US Patent 6,154,493. Filed 1998 by Intel. Issued 2000.
2. Tinku Acharya, Lina J. Karam, and **Francescomaria Marino**, "Real-time Algorithms and Architectures for Coding Images Compressed by DWT-Based Techniques," US Patent 6,124,811. Filed 1998 by Intel. Issued 2000.
3. Glen P. Abousleman, **Tuyet-Trang Lam**, and Lina J. Karam, "Communication System and Method for Multi-Rate, Channel-Optimized Trellis-Coded Quantization," US Patent 6,717,990. Filed 2000 by Motorola. Issued 2004.
4. **Katherine S. Tyldesley**, Glen P. Abousleman, and Lina J. Karam, "System and Method for Transmission of Video Signals using Multiple Channels," US Patent. Filed 2003 by General Dynamics.
5. Glen P. Abousleman, **Wei-Jung Chien** and Lina J. Karam, "Method and Apparatus for Network-Adaptive Video Coding," US Patent. Provisional filed 2007 by ASU. Full patent filed 2008 by ASU.
6. Lina J. Karam and **Asaad Said**, "Automatic Cell Migration and Proliferation Analysis," US Patent. Provisional filed 2008 (AZTE 037USP1) by ASU. Full patent filed 2009.

INVITED PRESENTATIONS AND SHORT COURSES

1. Lina J. Karam, "Color Video Coding at Very Low Bit Rates," IEEE Signal Processing & Communications Chapter, Phoenix, AZ, 1995.
2. Lina J. Karam, "Image Coding based on Perceptual Criteria," Motorola, Scottsdale, AZ, 1996.
3. Lina J. Karam, "Robust Image Coding Using Perceptually-Tuned Channel-Optimized Trellis-Coded Quantization," Midwest Symposium on Circuits and Systems, Las Cruces, NM, 1999.
4. Lina J. Karam, "Channel-Optimized Source Coding for the Transmission of Digital Imagery over Noisy Channels," The American University of Beirut, Beirut, Lebanon, July 2000.
5. Lina J. Karam, "Error-Resilient Video Coding with Channel-Optimized Trellis-Coded Quantization," IEEE Wireless Communications and Networking Conference, Chicago, IL, 2000.
6. Lina J. Karam, "Teaching Image Processing to High School Students," IEEE Digital Signal Processing Workshop, Hunt, TX, 2000.
7. Lina J. Karam, "Wavelet-Based Adaptive Image Denoising with Edge Preservation," General Dynamics, Scottsdale, AZ, 2004.
8. Lina J. Karam, "Freshman Introduction to Engineering," National Instruments, Austin, TX, 2005.
9. Lina J. Karam, "Selective Error Detection for Error-Resilient Image Coding and Transmission using Similarity Check Functions," Ss Cyril and Methodius University, Skopje, Macedonia, 2006.
10. Lina J. Karam, "Functional MRI," National Instruments, Austin, TX, 2007.
11. Lina J. Karam, "Basics of Image and Video Compression," Qualcomm, San Diego, CA, 2007. Invited Two-Day Short Course.
12. Lina J. Karam, "Image Compression: Foundations," *Qualcomm*, San Diego, CA, May 2008. Invited One-Day Short Course.
13. Lina J. Karam, "BLAST-DVC: BitPLane Selective Distributed Video Coding," *Center for Research in Mathematics (CIMAT)*, Guanajuato, Mexico, May 2008.
14. Lina J. Karam, "From Conventional to Distributed Video Coding," *IEEE Lebanon Section and American University in Beirut*, Beirut, Lebanon, July 2008.

15. Lina J. Karam, "Real-World Applications for Freshman Engineering Education," *NI Week*, Austin, TX, Aug. 2008.
16. Lina J. Karam, "Wyner-Ziv Based Low-Complexity Distributed Video Encoding," *New Mexico State University*, Las Cruces, NM, Nov. 2008.
17. Lina J. Karam. "Adaptive Rate-Distortion Based Wyner-Ziv Video Coding," *Multimedia, Mathematics and Machine Learning II*, BIRS, Banff Centre, Banff, Canada, July 2009.

PROFESSIONAL AND SCIENTIFIC SERVICE

Editorship

- Lead Editor for the IEEE Journal on Selected Topics in Signal Processing, Special Issue on Visual Quality Assessment (2007-2009)
- Editor for the IEEE Transactions on Image Processing (2007-present)
- Member of the Editorial Board of the Foundations and Trends in Signal Processing Journal (2006-present)
- Editor for the IEEE Signal Processing Letters (2004-2006)
- Editor for the IEEE Transactions on Image Processing (1998-2002)

Conference Activities

- General Chair (together with Ron Schafer) of the 14th IEEE Digital Signal Processing Workshop and 6th IEEE Signal Processing Education Workshop (to be held in Sedona, AZ, in January 2011).
- Technical Program Chair (together with Thrastos Pappas) of the 2009 IEEE International Conference on Image Processing.
- Co-Founder (together with Touradj Ebrahimi, *EPFL*, Kahled El-Maleh and Gokce Dane, *Qualcomm*), of the International Workshop on Quality of Multimedia Experience (QoMEX). <http://www.qomex.org>
- Co-Founder (together with Jorge Caviedes, *Intel*, and Sanjit Mitra, *UCSB and USC*) of the International Workshop on Video Quality for Consumer Electronics (VPQM). <http://www.vpqm.org>
- Technical Program Chair (together with Gokce Dane) of the First International Workshop on Quality of Multimedia Experience (QoMEX 2009).
- Technical Program Chair of the First International Workshop on Video Quality for Consumer Electronics (VPQM 2005).
- Organizing Committee Member
 - Fifth Georgia Tech Graduate Symposium (1994-1995)
 - IEEE Southwest Symposium on Image Analysis and Interpretation, 1998, Tuscon, Arizona – Finance and Registration Chair
 - IEEE International Conference on Acoustics, Speech, and Signal Processing, 1999, Phoenix, Arizona (IEEE ICASSP 1999) – Publicity Chair
 - IEEE International Conference on Image Processing, 2000, Vancouver, Canada (IEEE ICIP 2000) – Publicity Chair
 - First International Workshop on Video Quality for Consumer Electronics, 2005, Scottsdale, AZ (VPQM 2005) – Co-founder and Technical Program Chair

- IEEE International Conference on Acoustics, Speech, and Signal Processing, 2008, Las Vegas, Nevada (IEEE ICASSP 2008) – Social Program Chair
 - IEEE International Conference on Image Processing, 2009, Cairo, Egypt (IEEE ICIP 2009) – Technical Program Chair (together with Thrasos Pappas)
 - First International Workshop on Quality of Multimedia Experience, San Diego, CA, 2009, (QoMEX 2009; sponsored by the IEEE Signal Processing Society) – Co-founder and Technical Program Chair (together with Gokce Dane)
 - IEEE Digital Signal Processing (DSP) and Signal Processing Education (SPE) Workshops – General Chair (together with Ron Schafer), Sedona, AZ, 2011
 - IEEE International Conference on Image Processing, 2012, Orlando, Florida (IEEE ICIP 2012) – Tutorials Chair
- Technical Area Chair
 - IEEE International Conference on Image Processing (2007-2008)
 - IEEE International Conference on Acoustics, Speech, and Signal Processing (2007-2009)
 - IEEE International Symposium on Signal Processing and Applications (2007)
 - IEEE Asilomar Conference on Signals, Systems, and Computers (2008)
 - IEEE Signal Processing Education Workshop (2009)
- Technical Committee Member
 - IEEE International Conference on Acoustics, Speech, and Signal Processing (1996, 2004-2009)
 - IEEE International Conference on Image Processing (2002-2009)
 - IEEE International Symposium on Circuits and Systems (2002-2009)
 - IEEE Asilomar Conference on Signals, Systems, and Computers (1998, 2002, 2008)
 - SPIE Electronic Imaging (2006, 2007)
- Session chairing and organization for many conferences including IEEE ICIP, IEEE ICASSP, IEEE ISCAS, IEEE Asilomar, and IEEE ISSPA.
 - Reviewer for many conferences including IEEE ICIP, IEEE ICASSP, IEEE ISCAS, IEEE Asilomar, and IEEE ISSPA.

Journal Referee

IEEE Transactions on Image Processing
 IEEE Transactions on Signal Processing
 IEEE Transactions on Circuits and Systems II
 IEEE Transactions on Circuits and Systems for Video Technology
 IET Image Processing Journal
 IEEE Signal Processing Letters
 IET Electronics Letters
 EURASIP Journal on Image and Video Processing
 EURASIP Journal on Signal Processing

Local Professional Committee

- Treasurer of the IEEE Signal Processing & Communications Chapter, Phoenix Section (1996)
- Chair of the IEEE Phoenix Signal Processing & Communications Chapter (1997-1998)
- Member of the IEEE Phoenix Section (1997-1998)
- Vice-chair of the IEEE Signal Processing & Communications Chapter, Phoenix Section (1998-1999)
- Secretary of the IEEE Signal Processing & Communications Chapter, Phoenix Section (2000)

Scientific and Professional Society Memberships

- Member of the IEEE Signal Processing Society's Technical Directions Board (2008-present), and Chair of its Diversity Committee (July 2009-present)
- Elected Member of the IEEE Signal Processing Society's Image, Video, and Multidimensional Signal Processing (IVMSP) Technical Committee, formerly known as the IMDSP Technical Committee (2005-present).
- Elected Member of the IEEE Circuits and Systems (CAS) Society's DSP Technical Committee (1996-present)
- Member of the IEEE Signal Processing Conference Board (2003-2005)
- Member of the IEEE Signal Processing Society
- Member of the IEEE Circuits and Systems Society
- Member of the IEEE Communications Society
- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- Member of the American Society for Engineering Education (ASEE)
- Senior Member of the IEEE (since 2003)

Panelist / Proposal Reviewer

- Served on many NSF (USA) panels
- Reviewed NSF (USA) grant proposals
- Reviewed NSERC (Canada) grant proposals
- Reviewed grant proposals for national and international universities
- Reviewed DoD (USA) proposals

ASU COMMITTEE SERVICE

University

- General Studies Council (1998-2001)
- Numeracy Subcommittee of the General Studies Council (1998-2001)
- Member, AME Audio Faculty Search Committee (2005)
- Member, Consortium for Embedded and Inter-Networking Technologies (CEINT) Curriculum Committee (2004-2007)

College

- Faculty Recruiting Committees
 - CSE Computer Architecture subcommittee (1998-1999)
 - Biomedical Imaging subcommittee (2007)
- Dean's Diversity Committee (1999-2003)
- Member of several Ph.D. and M.S. Thesis Committees

Department

- Director of the Image, Video, and Usability (IVU) Lab (1996-present)
- Undergraduate Committee (1998)
- Director of the Real-time Embedded Signal Processing (RESP) Lab (2002-present)
- Signals and Systems Course (EEE303) Review and Planning Committee (2003-2004)
- Coordinator of the Freshman Introduction to Engineering Lab (2005-present)
- Chair of the Computer Engineering Undergraduate Curriculum Committee (2005)
- Member of the ECE 201/EEE 302/EEE 303 Course Redesign Committee (2005-2007)
- Several faculty search committees
- Systems Area Committee (1995-present)
- MSE Exam Committee (1996-present)
- Member of several Ph.D. and M.S. Thesis Committees

SPECIAL RECOGNITION

- Society of Women Engineers Outstanding Graduate Student Award (1994)
- U.S. National Science Foundation CAREER Award (1998)
- Professional Leadership & Service Recognition from the IEEE Signal Processing and the IEEE Communications societies (1999)
- Associate Editor Service Recognition awarded by the Editor-in-Chief of the IEEE Transactions on Image Processing, March 2002.
- Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), January 2003.
- Outstanding Technical Contributions Award, Digital Signal Processing, IEEE Phoenix Section, Jan. 2005.
- NASA Technical Innovation Award, 2006

ENTREPRENEURSHIP

- Founder and President of Muscale, LLC, an ASU spin-out company based on the biomedical image processing research conducted in the *Image, Video, and Usability (IVU) Lab*. <http://www.muscale.com>
- Founder and President of PICARIS, LLC, a consulting company.

STUDENTS' THESES AND DISSERTATIONS SUPERVISED

Ph.D. Graduates

Dr. Wei-Jung Chien

Date: February 2009

Thesis Title: Rate-Distortion Based Adaptive Distributed Video Coding

Affiliation: Qualcomm, San Diego, CA

Dr. Rony Ferzli

Date: November 2007

Thesis Title: Perceptual Based Image Quality Assessment and Enhancement

Affiliation: Microsoft, Seattle, WA

Dr. Tuyet-Trang (Snow) Lam

Date: May 2006

Thesis Title: Selective Error Detection and Error Concealment for Error-Resilient Wavelet-Based Image Coding

Affiliation: Intel, Chandler, AZ

Dr. Zoran Ivanovski

Date: June 2006 (Univ. of Ss. Cyril and Methodius, Skopje, Macedonia)

Thesis Title: Super-resolution for the Restoration of Compressed Video

Affiliation: **Assistant Professor**, Faculty of Engineering, University of Ss. Cyril and Methodius, Skopje, Macedonia, <http://dsp.feit.ukim.edu.mk/ZoranIvanovski.htm>

Dr. Zhen Liu

Date: December 2003

Thesis Title: Context-based and Perceptual-based Image Coding with Applications to JPEG2000

Affiliation: Qualcomm, San Diego, CA

Dr. Yassin Hasan

Date: December 2000

Thesis Title: Nonlinear Shape-Based Image Analysis and Coding

Affiliation: **Assistant Professor**, Assiut University, Assiut, Egypt

<http://www.icict.gov.eg/ICICT2004/YassinHasan.jsp>

Dr. Ingo Höntsch

Date: August 1999

Thesis Title: Adaptive Perceptual Coding of Visual Information

Affiliation: Institut Fur Rundfunktechnik (IRT), Munich, Germany

Post-Doctoral Students

Dr. Francescomaria Marino

Date: October 1997 – November 1998

Research Topic: Algorithms and Architectures for Wavelet-Based Image Compression

Affiliation: **Associate Professor**, Department of Electrical and Electronic Engineering, Politecnico di Bari, Bari, Italy, <http://dee.poliba.it/dee-web/marinoweb/home.html>

M.S. Graduates

Manal Jalloul

Date: June 2009 (American University of Beirut)

Thesis Title: Improving Side Information Generation in a Distributed Video Coding System

Affiliation: will pursue Ph.D. studies next year

Co-advised with Prof. M. Adnan Al-Alaoui at the American University of Beirut

Berkay Kanberoglu

Date: December 2008

Thesis Title: Novel Tools and Techniques in Neurosurgical Planning

Affiliation: currently pursuing Ph.D. studies under my supervision

Brian Lenoski

Date: May 2007

Thesis Title: Estimating the Autocorrelation of Functional Magnetic Resonance Imaging: Presurgical Mapping of Finger Movement and Reading Comprehension

Affiliation: Medical Numerics, Germantown, MD; also pursuing Ph.D. studies part-time under my supervision

Houssam Abbas

Date: May 2006

Thesis Title: Analysis and Suppression of Mosquito Noise in Compressed Video using Optimized Epsilon-Filters

Affiliation: Intel, Chandler, AZ; also pursuing Ph.D. studies part-time under my supervision

Juan Andrade Rodas

Date: July 2005

Thesis Title: Semi-Autonomous 3D Tracking

Affiliation: **Professor and Director**, School of Electronics and Telecommunications Engineering, University of Cuenca, Cuenca, Ecuador

<http://ingenieria.ucuenca.edu.ec/escuelas/telecomunicaciones/default.aspx>

<http://ingenieria.ucuenca.edu.ec/Paginas/Profesores1.aspx>

Mahesh Subedar

Date: May 2004

Thesis Title: Scalable Embedded Region-Of-Interest based Image

Affiliation: Intel, Chandler, AZ; also pursuing Ph.D. studies part-time under my supervision

Muhammad Yasin

Date: December 2003

Thesis Title: Web-Based Two-Dimensional Signal Processing

Katherine Tyldesley

Date: May 2003

Thesis Title: Wireless Video Coding and Transmission over the Iridium Network

Affiliation: IBM, Tucson, AZ

Charles Q. Zhan

Date: May 2003

Thesis Title: Adaptive Wavelet-Based Image Denoising with Edge Preservation

Affiliation: Honeywell, Phoenix, AZ

Lei Gao

Date: May 2002

Thesis Title: Error-Resilient Image Coding and Transmission over Wireless Channels

Affiliation: Honeywell, Phoenix, AZ

David Giguet

Date: December 2001

Thesis Title: Error-Resilient and Very Low Bit Rate Image Coding

Affiliation: Purple Labs, Chambery, France

Sumohana Channappayya

Date: December 2000

Thesis Title: Error-Resilient Image Coding and Transmission

Affiliation: received Ph.D. at UT Austin (under the supervision of Al Bovik), now with PacketVideo, San Diego, CA

Mohamad Owais Osmani

Date: December 1999

Thesis Title: Object-based Processing

Affiliation: Intel, Chandler, AZ

Tuyet-Trang (Snow) Lam

Date: August 1999

Thesis Title: Image Compression for Noisy Environments

Affiliation: received Ph.D. at ASU (under my supervision), now with Intel, Chandler, AZ

INSTRUCTION

New Courses Developed

1. **EEE 598 (now EEE 508) Digital Image Processing and Compression**

This is a three-credit graduate-level course that covers the fundamentals of digital image perception, representation, processing, and compression. The specific topics covered are:

- Two-Dimensional Digital Signal Processing Basics
- Vision and Perception
- Light and Color Models
- Image Segmentation
- Image Enhancement
- Image Restoration
- Basic Concepts in Information Theory
- Scalar and Vector Quantization
- Rate Distortion Theory
- Image Transforms
- Predictive, Transform, and Subband Coding
- Entropy Coding: Huffman and Arithmetic Coding
- Run-Length Coding
- JPEG and JPEG2000 Image Compression Standards
- Motion Estimation and Compensation
- ISO MPEG and ITU-T VCEG Video Compression Standards

More information can be found at <http://www.fulton.asu.edu/~karam/eee508/>

2. **EEE 598 (now EEE 507) Multidimensional Signal Processing**

This is a three-credit graduate-level course that is concerned with understanding signals of more than one variable and with systems for processing them. The specific topics covered are:

- Multi-D Discrete-Time(Space) Signals and Systems
- Multi-D Sampling
- Multi-D Discrete Fourier Transform (DFT)
- Multi-D Finite Impulse Response (FIR) Digital Filters
- Multi-D Z-Transform
- Multi-D Infinite Impulse Response (IIR) Digital Filters
- Processing of Propagating Space-Time Signals
- Multi-D Signal Restoration and Reconstruction

More information can be found at <http://www.fulton.asu.edu/~karam/eee507/>

3. EEE 498 (now EEE 404/EEE 591) Real-Time Digital Signal Processing

This is a four-credit senior-level course that provides the students with knowledge and hands-on experience in translating DSP concepts into real-time software for embedded systems using fixed-point DSP boards (Freescale DSP56858 and TI TMS320C5510). In addition to two 75-minute lecture sessions per week, on-campus students meet weekly for a three-hour laboratory session under the guidance of a TA. On-line students can access and control the lab equipment, boards, and software remotely, and can develop and run real-time applications from their remote location using the lab equipment, hardware, and software through a user-friendly “virtual bench” interface. I secured funding for the development of this course from the Consortium for Embedded and Inter-Networking Technologies (CEINT), Motorola, Freescale, Texas Instruments, and Tektronix.

The lecture topics covered are:

- Real-Time Systems: Introduction and Basics
- Basic Concepts in Signals and Systems: signals, Analog-to-Digital/Digital-to-Analog conversion, sampling and aliasing, quantization, discrete-time representation, filtering
- Digital Signal Processor Architectures: Harvard architecture, special addressing modes, parallel instructions, pipelining, real-time programming, modern digital signal processor architectures, hardware interfacing
- Computer Arithmetic: fixed-point and floating-point numbers, integer arithmetic
- Finite-wordlength effects: quantization, overflow, saturation, scaling, rounding and truncation
- Fixed-point Digital Signal Processors
- Fast Fourier Transforms and Applications: DTFT, DFT, FFT, implementation complexity, linear convolution, circular convolution, fast convolution, Short-Time Fourier Transform and Spectrogram
- Real-Time Multimedia and Communication Applications: speech processing, and/or audio processing, and/or image processing, and/or adaptive filtering, and/or modulation/demodulation, and/or matched filtering, and/or equalization.

The labs include:

- Lab 1: Overview of Hardware and Software Tools.
- Lab 2: Introduction to CodeWarrior.
- Lab 3: Introduction to the DSP56800E Assembly.
- Lab 4: Introduction to On-Chip Peripherals.
- Lab 5: Introduction to Processor Expert.
- Lab 6: Applications Using the DSP56858EVM CODEC.
- Lab 7: Real-Time Image Processing.
- Lab 8: Introduction to Code Composer Studio and TMS320C55x Assembly.
- Lab 9: Musical Notes Synthesis
- Lab 10: Introduction to On-Chip Peripherals and Music Equalizer
- Lab 11: Fast Fourier Transform
- Lab 12: Applications of Fast Fourier Transform (Spectrum Analysis and Speech Processing)
- Lab 13: Modem (optional)

More information can be found at <http://www.fulton.asu.edu/~karam/realdsp>

4. EEE/CSE 101 (now EEE 101) Introduction to Engineering Design

This is a Freshman level course which was developed to include two 50-minute lectures per week and a 2-hour hands-on lab session per week under the supervision of a TA. In addition, the students work in teams on two 4-week projects (one of which is a Robotics project) that build on the lab experiments. I secured funding for the development of this course from National Instruments (cash and equipment in the amount of \$120,000). The lecture component of this course was adapted from the previously taught ECE100 (Intro to Engineering Design) course. The lab component was fully developed from scratch as it was non-existent in the previous ECE100 course. The laboratory component of this course was designed to include hands-on lab experiments that expose entering freshman students to a wide range of areas in electrical and computer engineering including circuits, electronics, communications, analog and digital signal processing, digital image processing, computing hardware and software, embedded systems, robotics and control.

The developed labs include:

- Lab 1: Introduction to Circuits: NI ELVIS, Breadboard, Circuit elements
- Lab 2: Analog Audio Level Meter (using comparators)
- Lab 3: Noise Removal Using Analog Filters
- Lab 3: Analog Music Equalizer (using op-amps)
- Lab 4: Analog Music Composer (using 555 timers)
- Lab 5: Introduction to LabVIEW and SPEEDY-33 (programming, computer architecture, embedded systems, real-time DSP)
- Lab 6: Digital Audio Level Meter
- Lab 7: Noise Removal using Digital Filters
- Lab 8: Digital Music Equalizer
- Lab 9: Digital Music Composer
- Lab 10: Digital Sound Effects
- Lab 11: Introduction to Robotics
- Lab 12: Digital Image Processing Basics
- Lab 13: Webcam Applications
- Lab 14: Telephone
- Lab 15: Amplitude Modulation
- Lab 16: Modem

More information about the developed labs can be found in the publications and presentations posted at <http://www.fulton.asu.edu/~karam/introeng/>