
LINA J. KARAM

Professor and Fellow of the IEEE, Computer Engineering Program Chair

School of Electrical, Computer & Energy Engineering

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Research Topics and Publications Highlights

Signal, Image, and Video Processing, Compression, and Transmission; Computer Vision; Machine Learning; Perceptual-based Processing; Automated Quality Assessment and Monitoring; Multidimensional Signal Processing; Digital Filter Design.

220+ Journal and Conference Publications; 3 books; 7 book chapters; 9 patents; Graduated 40+ MS and PhD students as Thesis Advisor.

Google Scholar: <https://scholar.google.com/citations?user=VPaETnoAAAAJ>

Industry Collaborations and Technology Transfer

R&D collaborations on computer vision, image/video processing, image/video compression, image/video transmission, and digital filtering projects with industries including Intel, Google, NTT, Qualcomm, Microsoft, Motorola/Freescale, General Dynamics, and NASA.

Inventor on 9 patents

Consulting in Patent Litigation, Computer Vision, Image/Video Processing and Compression

Co-Founder, PICARIS, LLC and MUSCALE, LLC

Director, Image, Video & Usability (IVU) Laboratory

Director, Real-time Embedded Signal Processing (RESP) Laboratory

Education

Georgia Institute of Technology

Ph.D., Electrical Engineering, 1995

M.S., Electrical Engineering, 1992

American University of Beirut

B. E., Computer and Communications Engineering, 1989.

Employment

Computer Engineering Program Chair (Oct. 2016-present)

Professor (May 2010 – Present), School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ.

Associate Professor (August 2001 – May 2010), School 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.

Intern (1994), AT&T Bell Laboratories, Murray Hill, NJ.

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.
Intern (1992), Schlumberger, Austin, TX
Research Assistant (February 1990 - June 1991), Scientific Visualization Group, Georgia Institute of Technology, Atlanta, GA.
Intern (1988), Computing Department, Imperial College, London, UK.

Awards and Recognition

- IEEE Fellow
- Certificate of Recognition, IEEE Signal Processing Society, September 2016
- IEEE Signal Processing Society's Best Paper Award (IEEE Transactions Journal Paper)
- IEEE Signal Processing Society's Board of Governors.
- QoMEX 2012 Best Paper Award, July 2012
- Intel Outstanding Researcher Award, March 2012
- Outstanding Faculty Award, IEEE Phoenix Section, February 2012
- American University of Beirut Distinguished Alumnus Award, 2011
- Certificate of Merit, IEEE Signal Processing Society, 2009
- NASA Technical Innovation Award, 2006
- Outstanding Technical Contributions Award, Digital Signal Processing, IEEE Phoenix Section, Jan. 2005.
- Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), January 2003.
- Professional Leadership & Service Recognition from the IEEE Signal Processing and the IEEE Communications societies
- U.S. National Science Foundation CAREER Award
- Society of Women Engineers Outstanding Graduate Student Award at Georgia Tech

Editorship

- Chief Guest Editor for the Proceedings of the IEEE, Special Issue on Perceptual-Based Media Processing (2011-2013)
- Senior Editorial Board of the IEEE Signal Processing Magazine (2014-present).
- Editorial Board of the IEEE Journal on Selected Topics in Signal Processing (2014-present).
- Editorial Board, Foundation and Trends in Signal Processing (2006-present).
- Guest Editor for EURASIP Journal on Video Quality Metrics (2012-2013).
- Guest Editor for the IEEE Signal Processing Magazine, Special Issue on Multimedia Quality Assessment (2010-2011).
- Guest Editor for the EURASIP Journal on Image and Video Processing, Special Issue on Quality of Multimedia Experience (2009-2011).
- 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 (1999-2003 & 2006-2010)
- Editorial Board of the IEEE Signal Processing Letters (2004-2006)

Conference Activities

- General Chair of the 23rd IEEE International Conference on Image Processing (ICIP), to be held in Phoenix, AZ, September 2016.
- Co-founder of the World's First Visual Innovation Award to be presented for the first time at IEEE ICIP 2016.
- Initiator of the IEEE Xplore Open Paper Preview, which makes papers freely available open access prior to held conference and which results in higher impact for papers.
- Member of the organizing committee of the QoMEX 2016 conference (Lisbon, Portugal).
- Technical Area Chair, 2015 International Conference on Image Processing (2014-present)
- Area Chair, 2015 IEEE International Conference on Image Processing (ICIP) and 2015 IEEE International Conference on Circuits and Systems (IEEE CAS).
- General Chair (together with Jorge Caviedes) of the 2012 International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM), January 2012.
- General Chair (together with Ron Schafer) of the 14th IEEE Digital Signal Processing Workshop and 6th IEEE Signal Processing Education Workshop, Sedona, AZ, January 2011.
- Technical Program Chair (together with Thrassos 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).
- Served on the Organizing Committees and on the Technical Committees of several other international conferences.

Scientific and Professional Society Memberships

- IEEE Fellow (2013-present).
- IEEE Signal Processing Society's Board of Governors (2016 - present)
- IEEE Signal Processing Society's Image, Video, and Multidimensional Signal Processing (IVMSP) Technical Committee (2005-2011 & 2014-present)
- IEEE Circuits and Systems (CAS) Society's DSP Technical Committee (1996-present)
- Member of the IEEE Publication Services and Products Board (PSPB) Strategic Planning Committee (2014-2016).
- Member of the Award Board and Initiator of the World's First Visual Innovation Award presented for the first time at IEEE ICIP 2016.

- Member of the IEEE Signal Processing Society's Multimedia Technical Committee (2011-2014).
- Member of the IEEE Signal Processing Society's Appointments and Nominations Committee (2011-2014).
- Elected Member and Vice Chair of the IEEE Signal Processing Society's Education Technical Committee (2010-2012).
- Member of the IEEE Signal Processing Society's Technical Directions Board (2008-2009), and Chair of its Diversity Committee (2009).
- Member of the IEEE Signal Processing Conference Board (2003-2005).
- Member of the IEEE Signal Processing Society, IEEE Circuits and Systems Society, and IEEE Communications Society.
- Member of the Institute of Electrical and Electronics Engineers (IEEE).

Journals / Proposals / Patents / Programs Reviewer

- Reviewer for IEEE, Elsevier, and ACM journals
- Reviewer on NSF (USA) panels
- Reviewer for NSF (USA) grant proposals including SBIR proposals
- Reviewer for NSERC (Canada) grant proposals
- Reviewed grant proposals for national and international universities
- Reviewed DoD (USA) proposals
- Reviewer and consultant on patent validation
- Leader of Assessment of Engineering and Computer Science University Programs at the international level.

ASU University-Level Service

- Member, University Promotion and Tenure Committee (2014-2016)
- Member, AME Audio Faculty Search Committee (2005)
- Member, Consortium for Embedded and Inter-Networking Technologies (CEINT) Curriculum Committee (2004-2007)
- General Studies Council (1998-2001)
- Numeracy Subcommittee of the General Studies Council (1998-2001)

ASU College-Level Service

- Computer Engineering Program Chair (2106 – present)
- Dean's Faculty Advisory Committee (2011-2013)
- Member, ECEE/CSE Computer Engineering Steering Committee (ECEE and CSE) (2012-present)
- FSE Engineering Open House for Middle and High School Students
- FSE Summer Research Program for High-School Students
- BME Imaging Faculty Search Committee (2013)
- 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

ASU School-Level Service

- 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 (2005-2012)
- 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
- Development of new undergraduate (Freshman/Senior) and graduate courses.

INVITED PRESENTATIONS AND SHORT COURSES

1. *Distinguished Speaker*, "A Closer Look at Visual Attention Models," College of Engineering, Penn State University, April 2017.
2. *Invited Tutorial Lecture*, "Introduction to Image and Video Compression," Visual Signal Analysis and Processing (VSAP) Workshop, Khalifa University, Abu Dhabi, United Arab Emirates, November 2015.
3. *Plenary Distinguished Lecture*, "Attentive Visual Processing – Towards User-Centric Visual Technologies," International Conference on Computing, Networking and Communications (ICNC), February 2014.
4. *Intel Webinar*, "Automated Defect Detection and Identification for Semiconductor Units Undergoing Assembly and Test," Intel Corporation, November 2011.
5. *Plenary Talk*, "Efficient Perceptual-Based Image and Video Processing," Tenth FEA Student Conference, American University of Beirut, Beirut, Lebanon, May 2011.
6. *Expert Panel Talk*, "Trends in 3D Video Processing," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), May 2011.
7. *Invited Talk*, "Foundations and Trends of Visual Quality Assessment," American University of Beirut, Beirut, Lebanon, July 2010.
8. *Plenary Talk*, "Foundations and Trends of Visual Quality Assessment," 2nd International Workshop on Visual Information Processing (EUVIP), Paris, France, July 2010.
9. *Invited Talk*, "Adaptive Rate-Distortion Based Wyner-Ziv Video Coding," Multimedia, Mathematics and Machine Learning II, BIRS, Banff Centre, Banff, Canada, July 2009.
10. *Invited Talk*, "Wyner-Ziv Based Low-Complexity Distributed Video Encoding," New Mexico State University, Las Cruces, NM, Nov. 2008.
11. *Invited Lecture*, "Real-World Applications for Freshman Engineering Education," NI Week, Austin, TX, Aug. 2008.

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

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 7551671 B2. Filed 2003 by General Dynamics. **Issued June 2009.**

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 F. Said**, "Automatic Cell Migration and Proliferation Analysis," United States Patent 9,082,164. **Issued July 14, 2015.**
7. Lina J. Karam and **Samuel Dodge**, "Systems, Methods, and Media for Identifying Object Characteristics Based on Fixation Points," United States Patent 9,501,710 B2. **Issued November 22, 2016.**
8. Lina J. Karam and **Jinjin Li**, "Stereo Vision Based Automated Solder Ball Height Detection," United States Patent Application 14/662,074. Full Patent Filed March 18, 2015. **Technology Licensed by Intel through Arizona Technology Enterprises (AzTE).**

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.
3. Lina J. Karam, *Design of Complex Digital FIR Filters in the Chebyshev Sense*, Ph.D. Thesis, Georgia Institute of Technology, March 1995.

BOOK CHAPTERS

1. **Vicente Moleri**, Lina J. Karam, and Zoe Lacroix, "CLAST: Clustering Biological Sequences," in *Emerging Trends in Computational Biology, Bioinformatics, and Systems Biology* (Q. Nam and H. Arabnia Eds.), Chapter 10, pp. 203-220, Aug. 2015, Elsevier. ISBN: 978-0-12-802508-6. <http://www.sciencedirect.com/science/book/9780128025086>
2. **Nabil G. Sadaka** and Lina J. Karam, "Perceptually Driven Super-Resolution Techniques," in *Perceptual Digital Imaging: Methods and Applications*, Rastislav Lukac Editor, CRC Press/Taylor & Francis, 2012.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

REFEREED JOURNAL PAPERS (PUBLISHED OR ACCEPTED):

Note: Student authors are shown in boldface.

1. **S. Alirezah Golestaneh** and Lina J. Karam, "Reduced-Reference Quality Assessment Based on the Entropy of DWT Coefficients of Locally Weighted Gradient Magnitudes," accepted and to appear in the *IEEE Transactions on Image Processing*, vol. 25, no. 11, pp. 5293-5303 (11 pages), Nov. 2016.
2. **Bashar M. Haddad, Sen Yang**, Lina J. Karam, Jieping Ye, Nital Patel, and Martin Braun, "Multi-Feature, Sparse-Based Approach for Defects Detection and Classification in Semiconductor Units," accepted and to appear in the *IEEE Transactions on Automation Science and Engineering*, 15 pages, Aug. 2016, doi 10.1109/TASE.2016.2594288.
3. **Milind Gide** and Lina J. Karam, "A Locally Weighted Fixation Density-Based Metric for Assessing the Quality of Visual Saliency Predictions," *IEEE Transactions on Image Processing*, vol. 25, no. 8, pp. 3852-3861, Aug. 2016.
4. **Mahesh Subedar** and Lina J. Karam, "3D Blur Discrimination," *ACM Transactions on Applied Perception*, vol. 13, issue 3, article no. 12, 13 pages, May 2016, doi 10.1145/2896453.
5. **Jinjin Li**, Bonnie L. Bennett, Lina J. Karam, and Jeffrey S. Pettinato, "Stereo Vision Based Automated Solder Ball Height and Substrate Coplanarity Inspection," *IEEE Transactions on Automation Science and Engineering*, vol. 13, no. 2, pp. 757-771, April 2016.
6. **Srenivas Varadarajan** and Lina J. Karam, "A No-Reference Texture Regularity Metric Based On Visual Saliency," *IEEE Transactions on Image Processing*, vol. 24, no. 9, pp. 2784-2796, Sep. 2015.
7. **Qian Xu, Srenivas Varadarajan**, Chaitali Chakrabarti, and Lina J. Karam, "A Distributed Canny Edge Detector: Algorithm and FPGA Implementation," *IEEE Transactions on Image Processing*, pp. 2944-2960, vol. 23, no. 7, Jul. 2014.
8. **Tong Zhu** and Lina J. Karam, "A No-Reference Objective Image Quality Metric based on Perceptually Weighted Local Noise," *EURASIP Journal on Image and Video Processing*, 2014 (8 pages). Available online: <http://jivp.eurasipjournals.com/content/2014/1/5>.
9. **Berkay Kanberoglu**, Nina Z. Moore, David Frakes, Lina J. Karam, Josef P. Debbins, Mark C. Preul, "Neuronavigation using Three-Dimensional Proton Magnetic Resonance Spectroscopy Data," *Stereotactic and Functional Neurosurgery*, pp. 306-314, 92(5), 2014.
10. **Sin Lin Wu**, Jorge Caviedes, Lina Karam, and Ingrid Heynderickx, "The Effect of Applying 2D Enhancement Algorithms on 3D Video Content," *Hindawi Journal of*

Electrical and Computer Engineering, 11 pages, 2014. Online at: <http://dx.doi.org/10.1155/2014/601392>.

11. **Akshay Pulipaka**, Patrick Seeling, Martin Reisslein, and Lina J. Karam, "Traffic and Statistical Multiplexing Characterization of 3-D Video Representation Formats," *IEEE Transactions on Broadcasting*, 59(2), pp. 382-389, June 2013.
12. Lina J. Karam; W. Bastiaan Kleijn; Karon MacLean, "Perception-based Media Processing," *Proceedings of the IEEE*, 101(9), pp. 1900-1904, Sept. 2013.
13. **Asaad Said**, Bonnie Bennett, Lina Karam, Alvin Siah, Kyle Goodman, and Jeffrey Pettinato, "Automated Void Detection in Solder Balls in the Presence of Vias and Other Artifacts," *IEEE Transactions on Electronics Packaging Manufacturing*, vol. 2, no. 11, pp. 1890-1901, November 2012.
14. **Rohan Gupta**, **Akshay Pulipaka**, Patrick Seeling, Lina J. Karam, and Martin Reisslein, "H.264 Coarse Grain Scalable (CGS) and Medium Grain Scalable (MGS) Encoded Video: A Trace Based Traffic and Quality Evaluation," *IEEE Transactions on Broadcasting*, vol. 58, no. 3, pp. 428 to 439, September 2012.
15. Gaurav Sharma, Lina Karam, and Patrick Wolfe, "Select Trends in Image, Video, and Multidimensional Signal Processing," *IEEE Signal Processing Magazine*, pp. 5-8, Jan. 2012.
16. Lina J. Karam, **Nabil G. Sadaka**, **Rony Ferzli** and **Zoran A. Ivanovski**, "An Efficient Selective Perceptual-Based Super-Resolution Estimator," *IEEE Transactions on Image Processing*, vol. 20, no. 12, pp. 3470-3482, Dec. 2011.
17. Touradj Ebrahimi, Lina Karam, Fernando Pereira, Khaled El-Maleh, and Ian Burnett, "The Quality of Multimedia: Challenges and Trends," *IEEE Signal Processing Magazine*, pp. 17 & 148, Nov. 2011.
18. **Shyamprasad Chikkerur**, **Vijay Sundaram**, Martin Reisslein, and Lina J. Karam, "Objective Video Quality Assessment Methods: A Classification, Review, and Performance Comparison," *IEEE Transactions on Broadcasting*, vol. 57, no. 2, pp. 165-182, June 2011.
19. **Niranjan D. Narvekar** and Lina J. Karam, "A No-Reference Image Blur Metric Based on the Cumulative Probability of Blur Detection (CPBD)," *IEEE Transactions on Image Processing*, vol. 20, no. 9, pp. 2678-2682, Sep. 2011.
20. **Asaad F. Said**, Bonnie L. Bennett, Lina J. Karam, and Jeff Pettinato, "Automated Detection and Classification of Non-Wet Solder Joints," *IEEE Transactions on Automation Science and Engineering*, vol. 8, no. 1, pp. 67-80, Jan. 2011.

21. **Asaad F. Said**, Bonnie L. Bennett, Lina J. Karam, and Jeff Pettinato, "Robust Automated Void Detection in Solder Balls and Joints," *OnBoard Technology Magazine*, Issue of the Decade on Quality, pp. 36-41, Sep. 2010.
22. **Wei-Jung Chien** and Lina J. Karam, "Transform-Domain Distributed Video Coding with Rate-Distortion Based Adaptive Quantization," *IET Image Processing Journal, Special Issue on Distributed Video Coding*, pages 340-354, vol. 3, no. 6, December 2009.
23. Lina J. Karam, **Ismail AlKamal**, Alan Gatherer, Gene Frantz, David Anderson, and Brian Evans, "Trends in Multi-Core DSP Platforms," *IEEE Signal Processing Magazine, Special Issue on Signal Processing on Platforms with Multiple Cores*, pages 38-49, November 2009.
24. **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*, 20 pages, July 2009, DOI 10.1007/s11042-009-0314-8; pp. 437-456, 2010.
25. 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.
26. **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.
27. **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.
28. **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.
29. Andrew B. Watson, **Zhen Liu**, and Lina J. Karam, "JPEG2000 Encoding with Perceptual Distortion Control," *NASA Tech Brief*, pp. 37-38, Sep. 2008.
30. **Geert Van der Auwera**, Martin Reisslein, and Lina J. Karam, "Corrections to "Video Texture and Motion Based Modeling of Rate Variability-Distortion (VD) Curves," *IEEE Transactions on Broadcasting*, vol. 54, no. 1, pp. 166 – 166, Mar. 2008.

31. 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.
32. **Geert Van der Auwera**, Martin Reisslein, and Lina J. Karam, "Corrections to "Video Texture and Motion Based Modeling of Rate Variability-Distortion (VD) Curves," *IEEE Transactions on Broadcasting*, vol. 53, issue 4, pp. 811 – 811, Dec. 2007.
33. **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.
34. **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.
35. **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.
36. 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.
37. **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.
38. **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.
39. **M. Yassin Hasan** and Lina J. Karam, "Morphological Text Extraction from Images," *IEEE Transactions on Image Processing*, vol. 9, pp. 1978-1983, Nov. 2000.
40. **Ingo Höntsch** and Lina J. Karam, "Locally Adaptive Perceptual Image Coding," *IEEE Transactions on Image Processing*, vol. 9, pages 1472-1483, Sept. 2000.
41. **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.
42. **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.

43. **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.
44. Lina J. Karam and James H. McClellan, "Chebyshev Digital FIR Filter Design," *Signal Processing*, vol. 76, pages 17-36, July 1999.
45. Lina J. Karam, "Two-Dimensional FIR Filter Design by Transformation," *IEEE Transactions on Signal Processing*, vol. 47, pp. 1474-1478, May 1999.
46. 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.
47. 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.
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113. **Tuyet-Trang Lam**, Lina J. Karam, Rida A. Bazzi, and Glen P. Abousleman, "Reduced-Delay Selective ARQ for Low Bit-Rate Image and Multimedia Data Transmission," *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 2, pp. 309-312, Mar. 2005.
114. **Zoran A. Ivanovski**, Lina J. Karam, and Glen P. Abousleman, "Selective Bayesian Estimation for Efficient Super-Resolution," *Proc. 4th IEEE International Symposium on Signal Processing and Information Technology (IEEE ISSPIT)*, Rome, Italy, December 2004.

115. **Mahesh M. Subedar**, Lina J. Karam, and Glen P. Abousleman, "JPEG2000-Based Adaptive Algorithm for the Efficient Coding of Multiple Regions-of-Interest," *Proc. IEEE International Conference on Image Processing (IEEE ICIP)*, pages 1293 to 1296, Oct. 2004.
116. **Tuyet-Trang Lam**, Lina J. Karam, Rida A. Bazzi, and Glen P. Abousleman, "Selective FEC for Error-Resilient Image Coding and Transmission using Similarity Check Functions," *Proc. IEEE International Conference on Image Processing (IEEE ICIP)*, pages 3217 to 3220, Oct. 2004.
117. **Mahesh M. Subedar**, Lina J. Karam, and Glen P. Abousleman, "An Embedded Scaling-Based Arbitrary Shape Region-Of-Interest Coding Method for JPEG2000", *IEEE International Conference on Acoustics, Speech, and Signal Processing (IEEE ICASSP)* , vol. 3, pages 681-684, May 2004.
118. **Muhammad Yasin**, Lina J. Karam, and Andreas Spanias, "On-Line Laboratories for Image and Two-Dimensional Signal Processing," *IEEE Frontiers in Education Conference*, vol. 1, pages T3E_19- T3E_22, Nov. 2003.
119. **Charles Q. Zhan** and Lina J. Karam, "Wavelet-based Adaptive Image Denoising with Edge Preservation," *IEEE International Conference on Image Processing*, vol. 1, pages 97-100, Sep. 2003.
120. **Zhen Liu**, Lina J. Karam, and Andrew B. Watson, "JPEG2000 Encoding with Perceptual Distortion Control," *IEEE International Conference on Image Processing*, vol. 1, pages 637-640, Sep. 2003.
121. **Tuyet-Trang Lam**, Lina J. Karam, **Katherine Tyldesley**, and Glen P. Abousleman, "An Efficient Long-Term Memory Motion-Compensated Prediction Scheme and Application to Error-Resilient Video Transmission," *IEEE International Symposium on Signal Processing and its Applications*, vol. 1, pages 101-104, July 2003.
122. **Muhammad Yasin**, Lina J. Karam, and Andreas Spanias, "On-Line Laboratories for Image and Two-Dimensional Signal Processing Using 2D J-DSP," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, vol. 3, pages 785-788, 2003.
123. **Katherine Tyldesley**, Glen P. Abousleman, and Lina J. Karam, "Error-Resilient Multiple Description Video Coding for Wireless Transmission over Multiple Iridium Channels," *Proceedings of the SPIE, Visual Information Processing XII*, vol. 5108, pages 110-122, 2003.
124. **Zhen Liu** and Lina J. Karam, "Mutual Information Analysis of JPEG 2000 Contexts," *Proceedings of the SPIE* vol. 5022, *Electronic Imaging, Image and Video Communications and Processing*, pages 573-582, 2003.

125. **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.
126. **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.
127. 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.
128. **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.
129. **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.
130. **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.
131. **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.
132. **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.
133. **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.
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135. **David Giguët**, 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.
136. **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.
137. **Yassin M. Hasan**, Lina J. Karam, Matt Falkenburg, 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.
138. **David Giguët**, 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.
139. **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.
140. **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.
141. 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>.
142. **Zhen Liu** and Lina J. Karam, "An Efficient Embedded Zerotree Wavelet Image Codec Based on Intraband Partitioning," *IEEE International Conference on Image Processing*, vol. 3, pages 162-165, September 2000.
143. **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.
144. **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.
145. 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.

146. **Tuyet-Trang Lam**, Lina J. Karam, and Glen P. Abousleman, "Robust Image Coding Using Perceptually-Tuned Channel-Optimized Trellis-Coded Quantization," *42nd Midwest Symposium on Circuits and Systems*, vol. 2, pages 1131-1134, 2000.
147. **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.
148. 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.
149. 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.
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151. **Tuyet-Trang Lam**, Glen P. Abousleman, 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.
152. **Tuyet-Trang Lam**, Glen P. Abousleman, 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.
153. **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.
154. **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.
155. **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.
156. **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.

157. **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.
158. **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.
159. **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.
160. **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.
161. **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.
162. **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.
163. 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.
164. 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.
165. 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.
166. 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.
167. 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.

168. 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.
169. 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.
170. 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.
171. 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.

STUDENTS' THESES AND DISSERTATIONS SUPERVISED TO COMPLETION

Ph.D. Graduates

Dr. Jinjin Li

Date: May 2017

Thesis Title: Locally Adaptive Stereo Vision Based 3D Visual Reconstruction

Affiliation: Amazon Research Labs, San Jose, CA

Dr. Milind Gide

Date: December 2016

Thesis Title: Subjective and Objective Evaluation of Visual Attention Models

Affiliation: Edge 3 Technologies

Dr. Tong Zhu

Date: May 2016

Thesis Title: Perceptual-Based Locally Adaptive Noise and Blur Detection

Affiliation: Apple, San Jose, CA

Dr. Mahesh Subedar

Date: December 2015

Thesis Title: Visual Quality with a Focus on 3D Blur Discrimination and Texture Granularity

Affiliation: Intel, Chandler, AZ

Dr. Qian Xu

Date: December 2014

Thesis Title: Spatial and Multi-Temporal Visual Change Detection with Application to SAR Image Analysis

Dr. Srenivas Varadarajan

Date: May 2014

Thesis Title: Texture Structure Analysis

Affiliation: Intel Labs, Bangalore, India

Dr. Akshay Pulipaka

Date: December 2012

Thesis Title: Traffic Characterization and Modeling of H.264 Scalable & Multi-View Encoded Video

Affiliation: San Jose Startup Video Company

Dr. Nabil Sadaka

Date: December 2011

Thesis Title: Efficient Perceptual Super Resolution

Affiliation: Intel, Chandler, AZ

Dr. Asaad F. Said

Date: December 2010

Thesis Title: Noise Resilient Image Segmentation and Classification Methods with Applications in Biomedical and Semiconductor Images

Affiliation: Intel, Chandler, AZ

Awards: Joe Palais Outstanding Doctoral Dissertation Award
Intel Division Award

Dr. Ajit Devaraj

Date: October 2010

Thesis Title: Advanced Methods in Post Cartesian Imaging
(Co-advised with Dr. James Pipe, Barrow Neurological Institute)

Affiliation: Philips Medical Systems, Cleveland, OH

Dr. Ryan Robison

Date: May 2010

Thesis Title: Mitigation of Artifacts in T1-Weighted Spiral Projection Imaging
(Co-advised with Dr. James Pipe, Barrow Neurological Institute)

Affiliation: Philips Healthcare

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; Intel, Chandler, AZ

Dr. Tuyet-Trang (Snow) Lam

Date: May 2006

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

Affiliation: Motorola, Tempe, AZ; 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

Vinay KashyapTakmulPurushothamaRaju

Date: December 2014

Thesis Title: Fisheye Camera Calibration and Applications

Affiliation: Intel, Chandler, AZ

Tejas Borkar

Date: December 2013

Thesis Title: Automated Animal Coloration Quantification in Digital Images using Colors and Skin Classification

Affiliation: Pursuing PhD studies at ASU

Charan Prakash

Date: Spring 2012

Thesis Title: Camera Calibration using Adaptive Segmentation and Ellipse Fitting for Localizing Control Points

Affiliation: Pursuing PhD studies at ASU

Nicholas Werth

Date: February 2011

Thesis Title: Synthetic Aperture Radar Image Formation via Sparse Decomposition

Affiliation: Lockheed Martin

Vijay Sundaram

Date: September 2010

Thesis Title: Fast Algorithms and Architectures for High Throughput Encoding in H.264/AVC

(Co-advised with Dr. Chaitali Chakrabarti)

Affiliation: Intel, Portland, OR

Adithya Murthy

Date: May 2010

Thesis Title: Matlab Based Framework for Image and Video Quality Evaluation

Affiliation: Intel, Chandler, AZ

Vicente Moleri

Date: April 2010

Thesis Title: Genomic Sequence Clustering

Steven Chris Burns

Date: July 2009

Thesis Title: Real-Time Fixed-Point Wavelet-Based Image Compression

Affiliation: General Dynamics Decision Systems, Scottsdale, AZ

Manal Jalloul

Date: June 2009 (American University of Beirut)

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

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: Intel, Chandler, AZ

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

Houssam Abbas

Date: May 2006

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

Affiliation: Intel, Chandler, AZ; Postdoc at University of Pennsylvania

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 Coding

Affiliation: Intel, Chandler, AZ

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: worked with Packet Video, San Diego, CA, received Ph.D. at UT Austin (under the supervision of Prof. Al Bovik); Qualcomm, San Diego, CA; Associate Professor at IIT Hyderabad.

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

CURRENT DOCTORAL STUDENTS BEING SUPERVISED

Juan Andrade Rodas

Tejas Borkar

Samuel Dodge

Joshua Feinglass (co-advised with Daniel Bliss)

S. Alirezah Golestaneh

Bashar Haddad

Shanshi Huang

Ruolei Ji

Jinane Mounsef

Charan Prakash

Aditee Shrotre

INSTRUCTION

New Courses Developed

1. **EEE 508 Digital Image and Video Processing and Compression**

This is a four-credit graduate-level course that covers the fundamentals of digital image perception, representation, processing, and compression and include hands-on assignments and projects in OpenCV/C/C++, Matlab, and Android Studio. Some of the topics covered include:

- 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
- Motion Estimation
- 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://lina.faculty.asu.edu/eee508/>

2. **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
- Medical Imaging

More information can be found at <http://lina.faculty.asu.edu/eee507/>

3. **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 include:

- 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://lina.faculty.asu.edu/realdsp>

4. EEE/CSE/FSE 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