LINA J. KARAM

Fellow of the IEEE
President and Expert Consultant, PICARIS LLC
Emerita Professor, School of ECEE, Arizona State University, USA
Email: ljkaram@gmail.com, karam@asu.edu
Phone: +1 480 703 6053 (US)
Linkedin: https://www.linkedin.com/in/linakaram

Research Topics and Publications Highlights

Signal, Image, and Video Processing, Compression, and Transmission; Computer Vision; Machine Learning; Deep Learning; Autonomous Vehicles; Perceptual-based Processing; Visual Attention Models; Automated Quality Assessment; Multidimensional Signal Processing; Biomedical Signal Processing; Digital Filter Design. **Supervised to completion as main advisor 47 graduate students (24 PhD and 23 MS Thesis students)**

Industry Collaborations and Technology Transfer

Image and video processing and compression development at AT&T Bell Labs (Murray Hill); very low bit-rate scalable video codecs development and productization in collaboration with General Dynamics; autonomous driving technologies with Intel and technical advisor as part of AVTC ECOCAR Mobility Challenge; co-founder of biotech startup with product licensed to healthcare industries; inventor on patented visual compression, computer vision, and machine learning technologies; elected to IEEE Fellow for contributions in perceptual-based visual processing, image and video communications (including video compression and transmission) and digital filtering; multi-dimensional data processing and visualization at Schlumberger; R&D collaborations on computer vision, machine learning, image/video processing, compression, and transmission projects with various industries including Intel, Qualcomm, Google, NTT, Motorola, Freescale, General Dynamics, and NASA.

Highlights

Inventor on 8 issued US patents and on one published US Patent Application.
Expert delegate of the ISO/IEC JTC1/SC29 Committee (Coding of audio, picture, multimedia and hypermedia information) and participating in JPEG/MPEG standardization activities.
Expert consulting in IP/Patents, Image/Video Coding, Image/Video Processing, Computer Vision, Machine Learning
Emerita Professor, School of ECEE, Arizona State University (2020-Present)
Director, Image, Video & Usability (IVU) R&D Laboratory at ASU (1995-Present)
Editor-In-Chief, IEEE Journal on Selected Topics in Signal Processing (2019-2021)
National Academy of Inventors, ASU Chapter (2019-Present)
Featured in Stanford Study among the top 2% of World Scientists in AI and Image Processing
Featured in 8th edition of Research.com (2022) among World Top Computer Science Scientists
Dean, School of Engineering, Lebanese American University (2020-2022)
Director, Real-time Embedded Signal Processing (RESP) Laboratory (2000-2019)
Computer Engineering Program Chair, ASU Fulton Schools of Engineering (2016-2017)
Director of Industry Engagement, ASU Fulton Schools of Engineering (2018-2019)
President, PICARIS, LLC, a consulting company (2007-present)

Established the World's First Visual Innovation Award in 2016:
https://www.youtube.com/watch?v=pEZ2mT5sASw

https://fullcircle.asu.edu/faculty/visual-tech-visionaries-honored-innovation-awards/

Established the World's First Multimedia Star Innovator Award in 2019.

Established in 2018 an ASU-Silicon Valley Fellowship/Internship Program for Graduate Students (Computer Engineering, Electrical Engineering, Computer Science, Industrial Engineering) with TCL Research America as founding partner.

Established and led in 2018 a University-wide Intel-ASU Collaborative Initiative on Automated Mobility/Autonomous Cars with Intel, ADOT, DPS and GPEC as partners, which culminated in the establishment of the Governor's Institute on Automated Mobility (IAM) at the state level.

Established transdisciplinary Intel-ASU Autonomous Vehicle initiative (2017-2018) and lead PI on grant (funded in 2018):
https://transportation.asu.edu/projects/intel-asu-autonomous-vehicle-initiative/

ADAS lead advisor as part of the DoE/GM-sponsored Advanced Vehicular Technologies (AVTC) EcoCAR3 competition (2017-2018):
https://avtcseries.org/about-avtc/past-competitions/ecocar-3/

Interview with KJZZ 91.5 radio (NPR radio station in AZ) - Preliminary Report: Self-Driving Uber Car Didn't Alert Driver Of Collision Possibility (May 24, 2018):
https://kjzz.org/content/642626/preliminary-report-self-driving-uber-car-didnt-alert-driver-collision-possibility

Podcast-Driverless Cars (August 31, 2018): https://www.hh-wm.com/podcast/driverless-cars/

Interview with FOX 10 News - Cities and Driverless Cars (October 30, 2018):
http://www.fox10phoenix.com/news/arizona-news/cities-looking-at-how-self-driving-cars-can-change-their-communities

Interview with Phoenix Business Journal - Waymo and Self-Driving Truck Testing (May 29, 2019):
https://www.bizjournals.com/phoenix/news/2019/05/29/waymo-to-resume-self-driving-truck-testing-in.html

Judge on Vision Tank 2019 Start-Up Competition, Embedded Vision Summit, Santa Clara, CA, USA (May 22, 2019):
https://www.youtube.com/watch?v=X-bed7c04lY&feature=youtu.be&t=3

Interview with Associated Press - Verification stamps weren't pre-printed on Arizona ballot envelopes (September 29, 2021):
https://apnews.com/article/fact-checking-205460259311

Established in 2020-2022 the award-winning VIP+ program, adapting the Georgia Tech's Vertically Integrated Projects (VIP) model by intergrating an explicit entrepreneurial component into VIP, and served as VIP+ program director and lead LAU PI on grant funded by the US Department of State (US MEPI TLP grant); the established VIP+ program was granted three awards in 2022 by the International VIP Consortium consisting of 44 institutions in 13 countries (out of which 25 institutions are in the US):
https://news.lau.edu.lb/2022/laus-vertically-integrated-project-wins-major-international-consortium-awards.php
https://www.vip-consortium.org/node/1422

https://news.lau.edu.lb/2021/new-mepi-grant-to-boost-employability.php
https://mepitl.lau.edu.lb/news/the_lau_school_of_engineering_or.php
Video with students' testimonials: https://youtu.be/W0y1WNnd9ko

Established in 2021 a partnership between the United Nations Development Program (UNDP)'s Energy Innovation Hub and LAU School of Engineering and secured UNDP grant funding: https://eihub-lb.com/

Led an initiative with a consortium of industry partners to help advance the Renewable Energy/Solar Industry Sector in Lebanon and served as lead PI on USD multi-million proposal to USAID Trade and Investment Fund (USAID-TIF) to establish a photovoltaic (PV) pilot scale module manufacturing facility, a certified PV testing facility and a training facility to assist the local solar energy companies to build customizable high-quality PV panels. The submitted proposal was highly scored and has been selected to move to the co-creation stage with industry partners.
https://www.linkedin.com/feed/update/urn:li:activity:6894991934830501889/
https://news.lau.edu.lb/2022/toward-solar-panels-made-in-lebanon.php
https://news.lau.edu.lb/2022/harnessing-solar-energy-in-lebanon-with-the-support-of-usaid.php

Established in 2021 the First ENPMED (Engineering PreMed) program incorporating a Premed track in all engineering majors at the Lebanese American Univesity (LAU):
https://news.lau.edu.lb/2021/medicine-by-way-of-engineering-new-premed-track-at-lau.php

Established in 2021 iLEAP (industry-focused Lebanese Education & Academia Partnership) between LAU and LebNET (https://lebnet.us/), a non-profit US organization focused on education and mentoring, and comprising a network of technology experts, Fortune 500 managers and executives, venture capitalists and investors, startup founders and entrepreneurs, academics, consultants and small business owner in North America:
https://lebnet.us/LAU-iLEAP
https://news.lau.edu.lb/2021/lebnet-lau-initiative-adds-leverage-for-engineering-students.php

Developed and submitted to LAU's Board of Trustees in 2021 a proposal and business plan to establish the *LAU Industrial Hub*. The proposal was approved by LAU's Board of Trustees.

Interview with Al Nahar Newspaper – Engineering Premed (ENPMED), Medicine and Medical Technologies through Engineering (December 14, 2021):
https://www.annahar.com/arabic/section/77-%D9%85%D8%AC%D8%AA%D9%85%D8%B9/13122021062414414

SHORT BIO

Lina Karam is currently President and Expert Consultant at PICARIS LLC and an Emerita Professor at Arizona State University. Prior to becoming Emerita Professor, she was a tenured Full Professor, Computer Engineering Program Chair, Computer Engineering Director for Industry Engagement at Arizona State University. From 2020 to 2022, Dr. Karam served as Dean of the School of Engineering at the Lebanese American University. Dr. Karam is an IEEE Fellow, the highest grade level in IEEE which is conferred each year to no more than one-tenth of 1% of all IEEE voting members, for her contributions in the image and video processing, visual media coding and transmission, and digital filtering areas. Dr. Karam is a recipient of the National Science Foundation CAREER Award, NASA Technical Innovation Award, the Intel

Outstanding Researcher Award, the IEEE SPS Best Journal Paper Award, and the IEEE Phoenix Section Outstanding Faculty Award. She served as Editor-in-Chief of the high-impact IEEE Journal on Selected Topics in Signal Processing (IEEE JSTSP) from 2019 to 2021. At ASU, Dr. Karam helped in establishing two transdisciplinary programs, the Computer Engineering Program (across Computer Science and Electrical Engineering) and the Robotics & Autonomous Systems (RAS) Program (across four schools). Dr. Karam served on the IEEE Signal Processing Society (SPS) Board of Governors, IEEE SPS Conference Board, IEEE SPS Publications Board, IEEE SPS Awards Board, IEEE Circuits and Systems (CAS) Fellow Evaluation Committee, IEEE PSPB Strategic Planning Committee, IEEE TechRxiv Advisory Board (as Chair), IEEE SPS IVMSP and MMSP Technical Committees, IEEE CAS DSP Technical Committee, and various journal editorial boards. She served as the General Chair of IEEE ICIP 2016, General Co-Chair of IEEE ICME 2019, Technical Program Chair of IEEE ICIP 2009, General Chair of IEEE DSP/SPE 2011 Workshops. She cofounded the International Conference on Quality of Multimedia Experience (QoMEX). In addition to serving as the EiC of IEEE JSTSP, Dr. Karam served as the Lead Guest Editor, IEEE Signal Processing Magazine, Special Issue on Autonomous Driving. She is also serving on the IEEE Access Journal Senior Editorial Board, IEEE TechRxiv Editorial Board, Foundation and Trends in Signal Processing Journal Editorial Board, IEEE EAB Faculty Resources Committee and IEEE TAB/PSPB Products and Services Committee. She is an inventor with 8 issued US patents in the fields of image/video processing, coding, and transmission, computer vision, and AI/Machine Learning. She is an expert delegate of the ISO/IEC JTC1/SC29 Committee (Coding of audio, picture, multimedia and hypermedia information) and participating in JPEG/MPEG standardization activities.

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/POSITIONS

Emerita Professor, School of Electrical, Computer & Energy Engineering, Arizona State University, USA (2020-present)

President and Expert Consultant, PICARIS LLC, a technology consulting company (2007-present)

Professor and Dean, School of Engineering, Lebanese American University (2020-2022)

Computer Engineering Program Director (January 2018-December 2018)

Computer Engineering Graduate Program Chair (Oct. 2016-December 2017)

Professor (May 2010 – Dec 2019), 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 Usabilty (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.

INVITED PRESENTATIONS, SHORT COURSES, AND SELECT PANELS

1. *Invited Lecturer*, "Deep Learning for Quality Robust Visual Recognition," DeepLearn 2022, Guimaraes, Portugal, https://irdta.eu/deeplearn2022sp/
2. *Featured guest,* "Artificial Intelligence in Lebanon: Reality and Need," 1st Webinar and Panel Discussion on Artificial Intelligence being organized by the Order of Engineers and Architects in Lebanon (in-person and live streamed over social media), 11 February 2022. https://soe.lau.edu.lb/school/news/2022/webinar-and-panel-discussion-on-.php https://www.facebook.com/oeabeirut/videos/470212477889219/
3. *Panelist,* "Diversity Faculty Sharing Experiences," IEEE PROGRESS Workshop, USA, June 2021, October 2021, and June 2020.
4. *Keynote Speaker,* "Resilient Machine Learning for Automated Mobility," Communications of the ACM (ACM) Arabia Workshop, August 2020.
5. *Plenary/Keynote Speaker,* "Towards Resilient Deep Learning," IEEE International Conference on Image Processing, October 2020.
6. *Session Moderator,* Embedded Vision Summit, Silicon Valley, USA, May 2020.
7. *Judge/Panelist,* Vision Tank 2019 Start-Up Competition, Embedded Vision Summit, Santa Clara, CA, USA, May 2019.
8. *Invited Talk,* "Resilient Deep Learning through Feature Regeneration," Intel Corporation, Phoenix, AZ, April 2019. *Talk hosted by IEEE WIE Phoenix.*
9. *Panelist (the only engineer on panel among 6 panelists) with Waymo's CExO,* "Let's Talk Self-Driving: A Fireside Conversation with Waymo's Tekedra Mawakana," Arizona State University, Tempe, AZ, USA, April 2019.
10. *Invited Talk,* "Understanding Automated Driving Systems Technologies," Connected and Autonomous Vehicles 101 (CAV 101) Seminar and Roadshow; Education for Arizona Small Towns ans Satellite Cities; Tempe, AZ, USA, March 2019.
11. *Invited Talk and Panelist,* "Towards Safe, Efficient Automated Driving at Scale," American Bar Association (ABA) Smart Cities Conference, Tempe, AZ, USA, February 2019.
12. *Invited Talk,* "Generative Sensing: Reliable Recognition from Unreliable Sensor Data," Embedded Vision Summit, Santa Clara, CA, May 2018. ***Talk highly ranked by attendees.***
13. *Plenary Talk*, "Generative Sensing," International Conference on Computing, Networking, and Communications (ICNC), Maui, Hawaii, March 2018.

14. *Plenary Talk*, "Generative Sensing: Transforming Unreliable Sensor Data for Reliable Recognition," Twenty-Fourth National Conference on Communications (NCC) 2018, IIT Hyderabad, India, February 2018.
15. *Distinguished Speaker*, "A Closer Look at Visual Attention Models," College of Engineering, Penn State University, April 2017.
16. *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.
17. *Plenary Distingushed Lecture*, "Attentive Visual Processing – Towards User-Centric Visual Technologies," International Conference on Computing, Networking and Communications (ICNC), February 2014.
18. *Intel Webinar*, "Automated Defect Detection and Identification for Semiconductor Units Undergoing Assembly and Test," Intel Corporation, November 2011.
19. *Plenary Talk*, "Efficient Perceptual-Based Image and Video Processing," Tenth FEA Student Conference, American University of Beirut, Beirut, Lebanon, May 2011.
20. *Expert Panel Talk*, "Trends in 3D Video Processing," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), May 2011.
21. *Invited Talk*, "Foundations and Trends of Visual Quality Assessment," American University of Beirut, Beirut, Lebanon, July 2010.
22. *Plenary Talk,* "Foundations and Trends of Visual Quality Assessment," 2nd International Workshop on Visual Information Processing (EUVIP), Paris, France, July 2010.
23. *Invited Talk*, "Adaptive Rate-Distortion Based Wyner-Ziv Video Coding," Multimedia, Mathematics and Machine Learning II, BIRS, Banff Centre, Banff, Canada, July 2009.
24. *Invited Talk*, "Wyner-Ziv Based Low-Complexity Distributed Video Encoding," New Mexico State University, Las Cruces, NM, Nov. 2008.
25. *Invited Lecture*, "Real-World Applications for Freshman Engineering Education," NI Week*,* Austin, TX, Aug. 2008.
26. *Invited Lecture,* "From Conventional to Distributed Video Coding," IEEE Lebanon Section and American University in Beirut, Beirut, Lebanon, July 2008.
27. *Invited Lecture*, "BLAST-DVC: BitpLAne SelecTive Distributed Video Coding," Center for Research in Mathematics (CIMAT), Guanajuato, Mexico, May 2008.
28. *Short Course,* Lina J. Karam, "Image Compression: Foundations," Qualcomm, San Diego, CA, May 2008. Invited One-Day Short Course.
29. *Short Course,* Lina J. Karam, "Basics of Image and Video Compression," Qualcomm, San Diego, CA, 2007. Invited Two-Day Short Course.
30. *Guest Speaker,* "Functional MRI," National Instruments, Austin, TX, 2007.
31. *Invited Talk*, "Selective Error Detection for Error-Resilient Image Coding and Transmission using Similarity Check Functions," Ss Cyril and Methodius University, Skopje, Macedonia, 2006.
32. *Guest Speaker,* "Freshman Introduction to Engineering," National Instruments, Austin, TX, 2005.
33. *Invited Speaker,* "Wavelet-Based Adaptive Image Denoising with Edge Preservation," General Dynamics, Scottsdale, AZ, 2004.
34. *Invited Talk*, "Teaching Image Processing to High School Students,'' IEEE Digital Signal Processing Workshop, Hunt, TX, 2000.

35. *Invited Talk,* "Error-Resilient Video Coding with Channel-Optimized Trellis-Coded Quantization,'' IEEE Wireless Communications and Networking Conference, Chicago, IL, 2000.
36. *Invited Talk*, "Channel-Optimized Source Coding for the Transmission of Digital Imagery over Noisy Channels," The American University of Beirut, Beirut, Lebanon, July 2000.
37. *Invited Talk*, "Robust Image Coding Using Perceptually-Tuned Channel-Optimized Trellis-Coded Quantization,'' Midwest Symposium on Circuits and Systems, Las Cruces, NM, 1999.
38. *Guest Speaker*, "Image Coding based on Perceptual Criteria," Motorola, Scottsdale, AZ, 1996.
39. *Distinguished Lecture*, "Color Video Coding at Very Low Bit Rates," IEEE Signal Processing & Communications Chapter, Phoenix, AZ, 1995.

AWARDS AND RECOGNITION

- IEEE Fellow
- Editor-In-Chief, IEEE Journal on Selected Topics in Signal Processing (Jan 2019-Dec 2021)
- Invited Lecturer at DeepLearn 2022
- Invited Plenary/Keynote Speaker at the 2020 IEEE International Conference on Image Processing (IEEE ICIP)
- National Academy of Inventors, ASU Chapter (inducted in 2019)
- IEEE Region 6 "Outstanding IEEE member who promoted Women in Engineering" Award, 2018
- IEEE Phoenix Section Outstanding Contribution to Promoting Women in Engineering (WIE) Award, April 2018
- 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
- Founding Member, US Representative, QUALINET, European Network on Quality of Experience in Multimedia Systems and Services (Founded in 2009), http://www.qualinet.eu/
- NASA Technical Innovation Award for work on visual coding, 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 for work on perceptual-based image/video coding
- Society of Women Engineers Outstanding Graduate Student Award at Georgia Tech

EDITORSHIP

- Editor-In-Chief, IEEE Journal on Selected Topics in Signal Processing (Jan 2019-Dec 2021).
- Lead Guest Editor, IEEE Signal Processing Magazine, Special Issues on Autonomous Driving (2019-2021)
- Senior Editorial Board, IEEE IoT Magazine (2021-present)
- Editorial Board, IEEE Access (2019-present)
- 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 (2014-2019).
- Editorial Board of the IEEE Journal on Selected Topics in Signal Processing (2014-2017).
- 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)
- Editorial Board of the IEEE Transactions on Image Processing (1999-2003 & 2006-2010)
- Editorial Board of the IEEE Signal Processing Letters (2004-2006)

CONFERENCE ACTIVITIES

- Publicity Co-Chair, International Conference on Quality of Multimedia Experience (QoMEX), 2022.
- Awards Co-Chair, IEEE International Conference on Multimedia Information Processing and Retrieval (IEEE MIPR), 2022.
- Awards Co-Chair, IEEE International Conference on Image Processing, 2021.
- General Co-Chair of the IEEE International Conference of Multimedia and Expo (ICME), Shanghai, China, July 2019.
- General Chair of the 23rd IEEE International Conference on Image Processing (ICIP), Phoenix, AZ, September 2016.
- Initiator of the World's First Visual Innovation Award presented for the first time at IEEE ICIP 2016, and of the World's First Multimedia Star Innovator Award presented for the first time at IEEE ICME 2019.
- 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).
- 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 2011 IEEE Digital Signal Processing and IEEE Signal Processing Education Workshops, Sedona, AZ, January 2011.
- Technical Program Chair (together with Thrasos 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 Technical Activities Board (TAB)/Publication Services and Products Board (PSPB) Products and Services Committee (2023-present)
- IEEE Educational Activities Board (EAB) Faculty Resources Committee (2023-present)
- IEEE Access Journal Senior Editorial Board (2019-present)
- IEEE TechRxiv Editorial Advisory Board (2022-present)
- IEEE TechRxiv Advisory Board (2019-2021) and Ad-Hoc Committee Chair (2021-2021)
- IEEE Signal Processing Society's Conference Board (2003-2005 & 2017-2018 & 2021)
- IEEE Signal Processing Society's Publications Board (2019-2021)
- IEEE Signal Processing Society's Awards Board (2019-2020)
- IEEE Journal of Selected Topics in Signal Processing Senior Editor Board (2019-2021)
- IEEE Circuits and Systems Society's Fellow Evaluation Committee (2018 – 2019)
- IEEE Signal Processing Society's Board of Governors (2016 - 2018)
- IEEE Signal Processing Society's TC Review Committee (2016 - 2017)
- IEEE Signal Processing Society's Image, Video, and Multidimensional Signal Processing (IVMSP) Technical Committee (2005-2011 & 2014-2020)
- 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 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 and litigation
- Leader of Assessment of Engineering and Computer Science University Programs at the international level.

SELECT UNIVERSITY SERVICE

- Dean of Engineering, LAU (2020-2022)
- Computer Engineering Director, Industry Engagement, ASU (2018-2019)
- Initiated and led transdisciplinary initiatives on automated mobility and self-driving cars across four ASU campuses (Tempe, Downtown, Polytechnic, Washington DC) and across various schools and established academia-university-government partnerships, ASU (2017-2019)
- ADAS lead faculty advisor as part of the DoE/GM-sponsored Advanced Vehicular Technologies (AVTC) ECOCAR (EcoCAR3) Mobility Challenge, ASU (2017-2018)
- Established an ASU-Silicon Valley partnership and fellowship with TCL Research America as founding member (2018)
- Computer Engineering Program Chair, ASU (2016-2017)
- Helped in establishing two new transdisciplinary degree-granting graduate programs and served on their Graduate Program Committees (GPC) at ASU:
    - Computer Engineering (CEN): transdisciplinary program between 2 schools
    - Robotics and Autonomous Systems (RAS): transdisciplinary program between 4 schools
- University Promotion & Tenure Committee, ASU
- Engineering Dean's Faculty Advisory Council (DFAC), ASU

PATENTS

Note: Students co-inventors 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 Application Publication No. 2008/0259796 A1. **Published October 2008**.
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 Measurement System and Method," United States Patent 9,704,232 B2. Full Patent Filed March 18, 2015. **Issued July 11, 2017. Technology Licensed by Intel through Arizona Technology Enterprises (AzTE).**
9. Lina J. Karam and **Tejas Borkar**, "Systems and Methods for Feature Corrections and Regeneration for Robust Sensing, Computer Vision, and Classification," United States Patent US11,0304,85. **Issued June 2021**.

BOOKS

Note: Student authors are shown in boldface.

1. **Samuel Dodge** and Lina Karam, *Introduction to Machine Learning and Deep Learning: A Hands-On Starter's Guide*, 2017 1st version; revised 2020. Available online at: https://deeplearningtextbook.org/
2. Lina J. Karam and **Naji Mounsef**, *Introduction to Engineering: A Starter's Guide With Hands-On Digital Multimedia Explorations and Robotics,* Morgan-Claypool, 2008.
3. Lina J. Karam and **Naji Mounsef**, *Introduction to Engineering: A Starter's Guide With Hands-On Analog Multimedia Explorations,* Morgan-Claypool, 2008.
4. 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 Molieri**, 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," i*n 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. **Ruolei Ji** and Lina J. Karam, "Learning-based Visual Compression," *Foundations and Trends® in Computer Graphics and Vision*, vol. 15, no. 1, pp. 1-112, Jan. 2023.

2. **Yingpeng Deng** and Lina J. Karam, "Frequency-Tuned Adversarial Attacks on Texture Recognition," *IEEE Transactions on Image Processing*, vol. 31, pp. 5856-5868, Sept. 2022.

3. **Charan D. Prakash** and Lina J. Karam, "It GAN DO Better: GAN-based Detection of Objects on Images with Varying Quality," *IEEE Transactions on Image Processing*, vol. 30, pp. 9220-9230, Nov. 2021.

4. Lina J. Karam, Jay Katupitiya, Vicente Milanés, Ioannis Pitas, and Jieping Ye, "Autonomous Driving Part 2 – Learning and Cognition," *IEEE Signal Processing Magazine*, vol. 38, no. 1, pp. 20-21, Jan. 2021.

5. Lina J. Karam, Jay Katupitiya, Vicente Milanés, Ioannis Pitas, and Jieping Ye, "Autonomous Driving Part 1 – Sensing and Perception," *IEEE Signal Processing Magazine*, vol. 37, no. 4, pp. 11-13, July 2020.

6. **Bashar M. Haddad, Samuel F. Dodge,** Lina J. Karam, Nital S. Patel, and Martin W. Braun, "Locally Adaptive Statistical Background Modeling with Deep Learning-Based False Positive Rejection for Defect Detection in Semiconductor Units," *IEEE Transactions on Semiconductor Manufacturing*, vol. 33, issue 3, pp. 357-372, Aug. 2020.

7. **Tejas S. Borkar** and Lina J. Karam, "DeepCorrect: Correcting DNN Models against Image Distortions," *IEEE Transactions on Image Processing*, vol. 28, issue 12, pp. 6022-6034, Dec. 2019.

8. **Jinane S. Monsef** and Lina J. Karam, "Augmented Sparse Representation Classifier (ASRC) for Face Recognition under Quality Distortions," *IET Biometrics Journal,* vol. 8, issue 6, pp. 431-442, Nov. 2019.

9. **Samuel F. Dodge** and Lina J. Karam, "Human and DNN Classification Performance on Images With Quality Distortions: A Comparative Study," ACM Transactions on Applied Perception, vol. 16, issue 2, 18 pages, March 2019; doi 10.1145/3306241.

10. **Charan D. Prakash**, Farshad Akhbari, and Lina J. Karam, "Robust Obstacle Detection for Advanced Driver Assistance Systems using Distortions of Inverse Perspective Mapping of a Monocular Camera," *Robotics and Autonomous Systems Journal,* vol. 114, pp. 172-186, 2019.

11. **Samuel F. Dodge** and Lina J. Karam, "Quality Robust Mixtures of Deep Neural Networks," *IEEE Transactions on Image Processing,* vol. 27, no. 11, pp. 5553-5562, Nov. 2018.

12. **Samuel F. Dodge** and Lina J. Karam, "Visual Saliency Prediction Using a Mixture of Deep Neural Networks," *IEEE Transactions on Image Processing,* vol. 27, no. 8, pp. 4080-4090, August 2018.

13. **Aditee Shrotre** and Lina J. Karam, "Full Reference Objective Quality Assessment for Reconstructed Background Images," *Journal of Imaging*, vol. 4, no. 6, 82; 24 pages, June 2018. https://doi.org/10.3390/jimaging4060082

14. **Samuel Dodge**, **Jinane Mounsef**, and Lina J. Karam, "Unconstrained Ear Recognition using Deep Neural Networks," *IET Biometrics*, 8 pages. January 2018. doi: 10.1049/iet-bmt.2017.0208

15. **Milind S. Gide** and Lina J. Karam, "Computational Visual Attention Models," *Foundations and Trends® in Signal Processing*, vol. 10, no. 4, pp 347-427, 2017. http://dx.doi.org/10.1561/2000000055 (*invited*)

16. **S. Alirezah Golestaneh** and Lina J. Karam, "Reduced-Reference Quality Assessment Based on the Entropy of DWT Coefficients of Locally Weighted Gradient Magnitudes," *IEEE Transactions on Image Processing*, vol. 25, no. 11, pp. 5293-5303 (11 pages), Nov. 2016.

17. **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," *IEEE Transactions on Automation Science and Engineering*, 15 pages, Aug. 2016, doi 10.1109/TASE.2016.2594288.

18. **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.

19. **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.

20. **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.

21. **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.

22. **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.

23. **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.

24. **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.

25. **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.

26. **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.

27. Lina J. Karam, W. Bastiaan Kleijn, and Karon MacLean, "Perception-based Media Processing," *Proceedings of the IEEE*, 101(9), pp. 1900-1904, Sept. 2013.

28. **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.

29. **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.

30. 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.

31. 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.

32. 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.

33. **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.

34. **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.

35. **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.

36. **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.

37. **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.

38. 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.

39. **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.

40. 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.

41. **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.

42. **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.

43. **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.

44. Andrew B. Watson, **Zhen Liu**, and Lina J. Karam, "JPEG2000 Encoding with Perceptual Distortion Control," *NASA Tech Brief*, pp. 37-38, Sep. 2008.

45. **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.

46. 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.

47. **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.

48. **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.

49. **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.

50. **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.

51. 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.

52. **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.

53. **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.

54. **M. Yassin Hasan** and Lina J. Karam, "Morphological Text Extraction from Images," *IEEE Transactions on Image Processing*, vol. 9, pp. 1978-1983, Nov. 2000.

55. **Ingo Höntsch** and Lina J. Karam, "Locally Adaptive Perceptual Image Coding," *IEEE Transactions on Image Processing*, vol. 9, pages 1472-1483, Sept. 2000.

56. **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.

57. **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.

58. **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.

59. Lina J. Karam and James H. McClellan, "Chebyshev Digital FIR Filter Design," *Signal Processing*, vol. 76, pages 17-36, July 1999.

60. Lina J. Karam, "Two-Dimensional FIR Filter Design by Transformation," *IEEE Transactions on Signal Processing*, vol. 47, pp. 1474-1478, May 1999.

61. 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.

62. 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.

63. 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.

OTHER PUBLICATIONS

64. João Ascenso, Saleh Gholam Zadeh, Lina Karam, Evgeniy Upenik, Michela Testolina, "Exploration Study 2 on JPEG AI," *ISO/IEC JTC 1/SC29/WG1 N91040*, 91st JPEG Meeting, Apr. 2021.

65. Lina Karam, Ruolei Ji, and Fernando Pereira, "JPEG AI Exploration Study 1.1: Compressed Domain Image Classification," *ISO/IEC JTC 1/SC29/WG1 M91082*, 91st JPEG Meeting, Apr. 2021.

66. Lina Karam and Yingpeng Deng, "JPEG AI Exploration Study 1.3: Compressed Domain Material and Texture Recognition," *ISO/IEC JTC 1/SC29/WG1 M91105*, 91st JPEG Meeting, Apr. 2021.

67. João Ascenso, Saleh Gholam Zadeh, Lina Karam, Evgeniy Upenik, Michela Testolina, and Zhao Yin, "Exploration Study I on JPEG AI," *ISO/IEC JTC 1/SC29/WG1 N90056*, 90th JPEG Meeting, Jan. 2021.

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

REFEREED CONFERENCE PAPERS

Note: Student authors are shown in boldface.

1. **Ali Mezher**, **Yingpeng Deng**, and Lina J. Karam, "Visual Quality Assessment of Adversarially Attacked Images," *10th European Workshop on Visual Information Processing (EUVIP),* September 2022.

2. **Yingpeng Deng** and Lina J. Karam, "Universal adversarial attack via enhanced projected gradient descent," *IEEE International Conference on Image Processing,* pages 1241-1245, October 2020.

3. **Yingpeng Deng** and Lina J. Karam, "Frequency-Tuned Universal Adversarial Perturbations," *European Conference on Computer Vision Workshops,* pages 494-510, August 2020.

4. **Tejas Borkar,** Felix Heide, and Lina J. Karam, "Defending Against Universal Attacks through Selective Feature Regeneration," *IEEE Conference on Computer Vision and Patten Recognition (CVPR),* 11 pages, June 2020.

5. **Mohammad Hekmatnejad**, **Shakiba Yaghoubi**, **Adel Dokhanchi**, Heni Ben Amor, Aviral Shrivastava, Lina Karam, Georgios Fainekos, "Encoding and Monitoring Responsibility Sensitive Safety Rules for Automated Vehicles in Signal Temporal Logic," *ACM-IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE),* 11 pages, Oct. 2019.

6. **S. Alireza Golestaneh** and Lina J. Karam, "Synthesized Texture Quality Assessment via Multi-scale Spatial and Statistical Texture Attributes of Image and Gradient Magnitude Coefficients," *IEEE CVPR Workshop, NTIRE: New Trends in Image Restoration and Enhancement Workshop and Challenges*, 7 pages, June 2018.

7. **Jinane Mounsef** and Lina J. Karam, "Augmented Sparse Representation Classifier for Blurred Face Recognition," *IEEE International Conference on Image Processing (ICIP)*, 2018.

8. Lina J. Karam, **Tejas Borkar**, Junseok Chae, Yu Cao, "Generative Sensing: Transforming Unreliable Data for Reliable Recognition," *IEEE Multimedia Information Processing and Retrieval (IEEE MIPR)*, Apr. 2018.

9. **Samuel Dodge** and Lina Karam, "Can the Early Human Visual System Compete with Deep Neural Networks?," 7 pages, *International Conference on Computer Vision (ICCV), Workshop on Mutual Benefits of Cognitive and Computer Vision (MBCC),* Oct. 2017. *Oral Presentation.*

10. **Samuel Dodge** and Lina Karam, "A Study and Comparison of Human and Deep Learning Recognition Performance Under Visual Distortions," 7 pages, *International Conference on Computer Communications and Networks (ICCCN),* July-Aug. 2017.

11. **S. Alireza Golestaneh** and Lina J. Karam, "Spatially-Varying Blur Detection Based on Multiscale Fused and Sorted Transform Coefficients of Gradient Magnitudes," *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, July 2017.

12. **Juan Andrade** and Lina J. Karam, "Robust Radial Distortion Correction Based on Alternate Optimization," *IEEE International Conference on Image Processing*, pp. 2956-2960, Sep. 2016.

13. **Tong Zhu** and Lina J. Karam, "Efficient Perceptual-Based Spatially Varying Out-Of-Focus Blur Detection," *IEEE International Conference on Image Processing*, pp. 2673-2677, Sep. 2016.

14. **Milind S. Gide**, **Samuel F. Dodge**, and Lina J. Karam, "Visual Attention Quality Database For Benchmarking Performance Evaluation Metrics," *IEEE International Conference on Image Processing*, pp. 2792-2796, Sep. 2016.

15. **Bashar Haddad**, Lina Karam, Jieping Ye, Nital Patel, and Martin Braun, "Multi-Feature Sparse-Based Defect Detection and Classification in Semiconductor Units," *IEEE International Conference on Image Processing*, pp. 754-758, Sep. 2016.

16. **S. Alireza Golestaneh** and Lina J. Karam, "Reduced-Reference Synthesized-Texture Quality Assessment Based on Multi-Scale Spatial and Statistical Texture Attributes," *IEEE International Conference on Image Processing*, pp. 3783-3786, Sep. 2016.

17. **Samuel F. Dodge** and Lina J. Karam, "Understanding How Image Quality Affects Deep Neural Networks," *International Conference on the Quality of Multimedia Experience (QoMEX)*, 6 pages, June 2016. doi: 10.1109/QoMEX.2016.7498955

18. **Aditee Shrotre** and Lina J. Karam, "Visual Quality Assessment of Reconstructed Background Images," *International Conference on the Quality of Multimedia Experience (QoMEX)*, 6 pages, June 2016. doi: 10.1109/QoMEX.2016.7498954.

19. **Juan Andrade**, **Charan Prakash**, Farshad Akhbari and Lina J. Karam, "Low-Complexity and Low-Delay Structure from Motion Approach for Advanced Driver Assist Systems," *International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV)*, pp. 191-197, 2015.
http://worldcomp-proceedings.com/proc/p2015/IPCV_contents.html

20. **Mahesh M. Subedar** and Lina J. Karam, "A No Reference Texture Granularity Index and Application to Visual Media Compression," *IEEE International Conference on Image Processing*, pp. 760-764, September 2015.

21. **S. Alireza Golestaneh** and Lina J. Karam, "Reduced-Reference Quality Assessment Based on the Entropy of DNT Coefficients of Locally Weighted Gradients," *IEEE International Conference on Image Processing*, pp. 4117-4120, September 2015.

22. **S. Alireza Golestaneh, Mahesh M. Subedar,** and Lina J. Karam, "The effect of texture granularity on texture synthesis quality," *Proc. SPIE 9599, Applications of Digital Image Processing XXXVIII, 959912*, 6 pages, September 2015; doi: 10.1117/12.2189466

23. **Mahesh M. Subedar** and Lina J. Karam, "A subjective study and an objective metric to quantify the granularity level of textures," *Proc. SPIE 9394, Human Vision and Electronic Imaging XX, 93940G*, 8 pages, March 2015; doi: 10.1117/12.2084501

24. Lina J. Karam and **Tong Zhu**, "Quality labeled faces in the wild (QLFW): a database for studying face recognition in real-world environments," *Proc. SPIE 9394, Human Vision and Electronic Imaging XX, 93940B*, 10 pages, March 2015; doi: 10.1117/12.2080393

25. **Charan Prakash, Jinjin Li**, Farshad Akhbari, and Lina Karam, "Sparse Depth Calculation using Real-time Key-point Detection and Structure from Motion for Advanced Driver Assist Systems," Springer Lecture Notes, ISVC, pp. 740-751, December 2014.

26. **Tejas Borkar** and Lina J. Karam, "Automated Bird Plumage Coloration Quantification in Digital Images," Springer Lecture Notes, ISVC, pp. 220-229, December 2014.

27. **Srenivas Varadarajan** and Lina J. Karam, "A Reduced-Reference Perceptual Quality Metric for Texture Synthesis," *IEEE International Conference on Image Processing (ICIP)*, pp. 531-535, October 2014.

28. **Srenivas Varadarajan** and Lina J. Karam, "Adaptive Texture Synthesis based on Perceived Texture Regularity," *International Workshop on the Quality of Multimedia Experience (QoMEX)*, September 2014.

29. **Qian Xu** and Lina J. Karam, "Change Detection on SAR Images using Divisive Normalization-based Image Representation," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 4339-4343, May 2014.

30. **Jinjin Li**, Bonnie Bennett, Lina Karam, and Jeffrey Pettinato, "Stereo Vision Based Automated Solder Ball Height Detection," *IPC APEX EXPO Conference and Exhibition,* Mar. 2014.

31. **Mahesh Subedar** and Lina J. Karam, "Study of blur discrimination for 3D stereo viewing," *Proceedings of the SPIE, vol. 9011, Stereoscopic Displays and Applications XXV, 90110T,* 6 pages, March 2014, doi: 10.1117/12.2042517

32. Samuel Dodge and Lina Karam, "An Evaluation of Attention Models for Use in SLAM ," *Proc. SPIE* 9025, *Intelligent Robots and Computer Vision XXXI: Algorithms and Techniques, 90250M,* February 2014; doi:10.1117/12.2043042

33. Srenivas Varadarajan and Lina Karam, "Effect of Texture Regularity on Perceptual Quality of Compressed Textures," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM),* 5 pages, Jan. 2014. Online Proceedings at www.vpqm.org.

34. **Milind Gide** and Lina Karam, "Visual Attention Prediction for Highly Attentive Regions," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM),* 5 pages, Jan.-Feb. 2013. Online Proceedings at www.vpqm.org.

35. **Berkay Kanberoglu**, Nina Z. Moore, David Frakes, Lina J. Karam, Josef P. Debbins, and Mark C. Preul, "Integration of 3D ^{1}H-magnetic resonance spectroscopy data into neuronavigation systems for tumor biopsies," Proceedings of SPIE, Medical Imaging, Image-Guided Procedures, Robotic Interventions, and Modeling Vol. 8671, id. 86711B, 7 pages, March 2013. doi:10.1117/12.2007778

36. **Qian Xu** and Lina J. Karam, "Change detection on SAR images by a parametric estimation of the KL-divergence between Gaussian Mixture Models," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 2109-2113, May 2013.

37. **Srenivas Varadarajan** and Lina J. Karam, "A no-reference perceptual texture regularity metric," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 1894-1898, May 2013.

38. **Aditee Shrotre** and Lina J. Karam, "Background recovery from multiple images," *IEEE Digital Signal Processing Workshop*, pp. 135-140, 2013.

39. **Samuel F. Dodge** and Lina J. Karam, "Is Bottom-Up Attention Useful for Scene Recognition?," *6th International Symposium on Attention in Cognitive Systems (ISACS), held in conjunction with the International Joint Conference on Articial Intelligence (IJCAI)*, 10 pages, Aug. 2013. Available online at http://arxiv.org/abs/1307.5702

40. **Samuel F. Dodge** and Lina J. Karam, "Attentive Gesture Recognition," *IEEE International Conference on Image Processing (ICIP)*, pp. 177-180, September 2012.

41. **Charan D. Prakash** and Lina J. Karam, "Camera Calibration using Adaptive Segmentation and Ellipse Fitting for Localizing Control Points," *IEEE International Conference on Image Processing (ICIP)*, pp. 341-344, September 2012.

42. **Milind S. Gide** and Lina J. Karam, "Improved Foveation- and Saliency-Based Visual Attention Prediction under a Quality Assessment Task," *International Workshop on the Quality of Multimedia Experience (QoMEX)*, pp. 200-205, July 2012 (Best Paper Award).

43. Henry R. Wu, Weisi Lin and Lina Karam, "An Overview of Perceptual Processing for Digital Pictures", *IEEE International Conference on Multimedia and Expo Workshops (ICME 2012)-International Workshop on Emerging Multimedia Systems and Applications*, pp.113-120, July 2012.

44. **Jinane Mounsef** and Lina Karam, "Fully Automated Quantification of Leaf Venation Structure", *International Conference of Artificial intelligence (ICAI)*, pp. 1-6, July 2012.

45. **Tong Zhu**, Lina J. Karam, and Truyet-Trang Lam, "Subjective Assessment of Compressed 3D Video," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM),* Jan. 2012. Online Proceedings at www.vpqm.org.

46. **Milind S. Gide** and Lina J. Karam, "Comparative Evaluation of Visual Saliency Models for Quality Assessment Task," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM),* Jan. 2012. Online Proceedings at www.vpqm.org.

47. **Jinjin Li** and Lina J. Karam, "Depth Estimation from Multi-View Images," *IEEE International Conference on Emerging Signal Processing Applications (ESPA)*, pp. 151-154, Jan. 2012.

48. Kazuhisa Yamagishi, Lina Karam, Jun Okamoto, and Takanori Hayashi, "Subjective Characteristics for Stereoscopic High Definition Video," *Third International Workshop on Quality of Multimedia Experience (QoMEX),* pp. 37-42, Sep. 2011.

49. **Nabil Sadaka** and Lina J. Karam, "Efficient Super-Resolution Driven by Saliency Selectivity," *IEEE International Conference on Image Processing (ICIP)*, Sep. 2011.

50. Kazuhisa Yamagishi, Lina Karam, Jun Okamoto, "Quality-Estimation Model for Stereoscopic Video Services," *IEICE Tech. Rep., CQ2011-23*, vol. 111, no. 132, pp. 29-32, July 2011. http://www.ieice.org/ken/paper/2011071470hZ/eng/

51. **Jinane Mounsef** and Lina Karam, "Automated Analysis of Leaf Venation", *IEEE Workshop on Computational Intelligence for Visual Intelligence (CIVI),* pp. 1-5, Apr. 2011.

52. **Berkay Kanberoglu**, Lina J. Karam, and David Frakes, "Dictionary-Based Sparsification and Reconstruction (DIBSAR)," *19th Annual ISMRM meeting*, May 2011. Online Program at http://www.ismrm.org/11/.

53. **Qian Xu**, Chaitali Chakrabarti, and Lina J. Karam, "A Distributed Canny Edge Detector And Its Implementation on FPGA," *14th IEEE Digital Signal Processing & Signal Processing Education Workshop*, pp. 500-505, Jan. 2011.

54. Lina J. Karam and **Naji Mounsef**, "Increasing Retention through Introduction to Engineering Design," *14th IEEE Digital Signal Processing & Signal Processing Education Workshop*, pp. 186-191, Jan. 2011.

55. **Sundaram Vijay**, Chaitali Chakrabarti and Lina J. Karam, "Parallel deblocking filter for H.264 AVC/SVC," *IEEE Workshop on Signal Processing Systems (SiPS),* pp. 116-121, Oct. 2010.

56. **Nabil G. Sadaka** and Lina J. Karam, "Super-Resolution using a Wavelet-Based Adaptive Wiener Filter," *IEEE International Conference on Image Processing (ICIP)*, pp. 3309-3312, Sept. 2010.

57. **Jinane Mounsef**, Lina Karam, Patricia Estes, and Daniela Zarnescu, "Shape Analysis and Classification of lgl-Type and Wild-Type Neurons," *ACM International Conference on Bioinformatics and Computational Biology (ACM-BCB)*, pp. 362-365, Aug. 2010.

58. **Srenivas Varadarajan**, Lina J. Karam, and Dinei Florencio, "Background Subtraction using Spatio-Temporal Continuities," *2nd European Workshop on Visual Information Processing (EUVIP)*, pages 144-148, July 2010.

59. **Adithya V. Murthy** and Lina J. Karam, "A MATLAB-Based Framework for Image and Video Quality Evaluation," *International Workshop on Quality of Multimedia Experience (QoMEX)*, pp. 242-247, June 2010.

60. **Asaad F. Said**, Bonnie L. Bennett, Francis Toth, Lina J. Karam, and Jeff Pettinato, "Non-Wet Solder Joint detection in Processor Sockets and BGA Assemblies," *Electronic Components and Technology Conference (ECTC)*, pp. 1147-1153, May 2010.

61. **Asaad F. Said**, Lina J. Karam, and Scott R. Gehler, "Use of Muscale CMA_{cfz} Automated Image Analysis Software to Accurately Quantitate Cell Migration", 16th Annual Society for Biomolecular Sciences Conference (SBS), Apr. 2010.

62. **Asaad F. Said,** Bonnie L. Bennett, Lina J. Karam, and Jeff Pettinato, **"**Robust Automatic Void Detection in Solder Balls and Joints," *IPC APEX EXPO Conference and Exhibition,* Apr. 2010.

63. **Berkay Kanberoglu**, Lina J. Karam, and Josef P. Debbins, "Context-Based GRAPPA Reconstruction using a Small Kernel," *18th Annual ISMRM meeting*, Apr. 2010. Online Program at http://www.ismrm.org/10/

64. **Berkay Kanberoglu**, Josef P. Debbins, and Lina J. Karam, "Accurate Brain Tumor Biopsy Using 3D ^{1}H-MRS Neuronavigation," *18th Annual ISMRM meeting*, Apr. 2010. Online Program at http://www.ismrm.org/10/

65. **Asaad F. Said,** Bonnie L. Bennett, Lina J. Karam, and Jeff Pettinato, **"**Robust Automatic Void Detection in Solder Balls," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 1650-1653, Mar. 2010.

66. **Milind S. Gide** and Lina J. Karam, "On the Assessment of the Quality of Textures in Visual Media," *44th Annual Conference on Information Sciences and Systems (CISS)*, pp. 1-5, Mar. 2010.

67. **Srenivas Varadarajan**, Chaitali Chakrabarti, Lina J. Karam, and Judith Martinez Bauza, "A Distributed Psycho-Visually Motivated Canny Edge Detector," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Mar. 2010.

68. **Niranjan D. Narvekar** and Lina J. Karam, "An Improved No-Reference Sharpness Metric Based on the Probability of Blur Detection," *International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM)*, Jan. 2010. Available Online at http://www.vpqm.org/

69. **Akshay Pulipaka**, Patrick Seeling, Martin Reisslein, and Lina J. Karam, "Overview and Traffic Characterization of Coarse-Grain Quality Scalable (CGS) H.264 SVC Encoded Video," *IEEE Consumer Communication and Networking Conference (CCNC)*, pp. 1-5, Jan. 2010.

70. **Mahesh M. Subedar** and Lina J. Karam, "Increased Depth Perception with Sharpness Enhancement for Stereo Video," *SPIE Electronic Imaging*, Stereoscopic Displays and Applications XXI, vol. 7524, Jan. 2010, DOI: 10.1117/12.840344.

71. **Mahesh M. Subedar** and Lina J. Karam, "A Study of Relation between Blur and Depth in Stereoscopic Images," International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM), Jan. 2010. Available Online at http://www.vpqm.org/

72. **Niranjan D. Narvekar**, **Bharatan Konnanath**, **Shalin Mehta**, **Santosh Chintalapati**, **Ismail AlKamal**, Chaitali Chakrabarti and Lina J. Karam, "An H.264/SVC Memory Architecture Supporting Spatial and Coarse-Grained Quality Scalabilities," *IEEE International Conference on Image Processing (ICIP),* pages 2661 – 2664, Nov. 2009.

73. **Wei-Jung Chien** and Lina J. Karam, "AQT-DVC: Adaptive Quantization for Transform-Domain Distributed Video Coding,**"** *IEEE International Conference on Image Processing (ICIP)*, pages 3113 – 3116, Nov. 2009.

74. **Asaad F. Said**, Bonnie L. Bennett, Lina J. Karam and Jeff Pettinato, "A Versatile Automated Defect Detection and Classification System for Assembly, Test Semi-conductor Manufacturing," in *International SEMATECH Manufacturing Initiative (ISMI) Symposium*, 2009.

75. **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)*, pages 87 – 91, July 2009.

76. **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. Online Program at http://www.ismrm.org/09/

77. **Berkay Kanberoglu**, N. Zobenica, R. Ryan, M. C. Preul, Lina J. Karam, and Josef P. Debbins, "Accurate Brain Tumor Biopsy using 3D ^{1}H-MRS Neuronavigation," *17th Annual ISMRM meeting*, Apr. 2009. Online Program at http://www.ismrm.org/09/

78. **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. Program at http://www.ismrm.org/09/

79. **Chu-Yu Lee**, Kevin M. Bennett, Lina J. Karam, and Josef P. Debbins, "A Comparison of Two Models of Anomalous DWI Based on a Known Distribution of Water Diffusion Rates," *17th Annual ISMRM meeting*, Apr. 2009. Online Program at http://www.ismrm.org/09/

80. **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.

81. **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.

82. **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. Available Online at http://www.vpqm.org/

83. **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. Available Online at http://www.vpqm.org/

84. **Asaad F. Said** and Lina J. Karam, "Multi-Region Texture Image Segmentation based on Constrained Level-Set Evolution Functions," *IEEE DSP/SPE Workshop*, pages 664-668, Jan. 2009.

85. **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.

86. **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.

87. **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.

88. **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.

89. **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.

90. **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.

91. **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.

92. **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.

93. **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 Brian Mapping*, Chicago, IL, Jun. 2007.

94. **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.

95. **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 vol. 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.

96. **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.

97. **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.

98. **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, Hawai, Apr. 2007.

99. **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, Hawai, Apr. 2007.

100. **Asaad Said**, Lina J. Karam, Michael E. Berens, Zoé Lacroix, and Rosemary A. Renaut, "Migration and proliferation analysis for bladder cancer cells," *IEEE International Symposium on Biomedical Imaging: Macro to Nano*, pages 320-323, Washington, DC, Apr. 2007.

101. **Tomislav Kartalov**, **Zoran A. Ivanovski**, Ljupcho Panovski, and Lina J. Karam, 'Compression Artifacts Removal Using an Adaptive POCS Algorithm and Explicit Region Modeling,' *Sciences of Electronic, Technologies of Information and Telecommunications (SETIT)*, Hammamet, Tunisia, Mar. 2007.

102. **Tomislav Kartalov**, **Zoran A. Ivanovski**, Ljupcho Panovski, and Lina J. Karam, "An Adaptive POCS Algorithm for Compression Artifacts Removal," *International Symposium on Signal Processing and Applications (ISSPA)*, Sharjah, UAE, Feb. 2007.

103. **Rony Ferzli** and Lina Karam, "A No Reference Objective Sharpness Metric using Riemannian Tensor," *3rd International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM)*, Scottsdale, AZ, Jan. 2007. On-line proceedings at www.vpqm.org.

104. Lina J. Karam and **Naji Mounsef**, "Integrating Visual Programming, Instrumentation, and Embedded DSP Technology into Freshman Introduction to Engineering Design," *IEEE Signal Processing Education Workshop*, pages 466-471, Sep. 2006.

105. **Rony Ferzli** and Lina J. Karam, "Virtual Bench for Online Real Time Digital Signal Processing Students," *IEEE Signal Processing Education Workshop*, pages 450-455, Sep. 2006.

106. **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.

107. **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.

108. **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).

109. **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.

110. **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.

111. **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.

112. **Wei-Jung Chien**, Lina J. Karam, and Glen P. Abousleman, "Distributed Video Coding with 3-D Recursive Search Block Matching," *IEEE International Symposium on Circuits and Systems (ISCAS),* vol. 2, pages 5415-5418, May 2006.

113. **Wei-Jung Chien**, Tuyet-Trang Lam, Glen P. Abousleman, and Lina J. Karam, "Automatic Network-Adaptive Ultra-Low-Bit-Rate Video Coding," Visual Information Processing XV, SPIE Symposium on Defense and Security, pages 624606-1 to 624606-10, April 2006.

114. **Rony Ferzli** and Lina J. Karam, "A Human Visual System-Based Model for Blur/Sharpness Perception," *2nd International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM06,* ISBN: 09774739*)*, Scottsdale, AZ, Jan. 2006, electronic proceedings at http://www.vpqm2006.org/

115. **Zoran A. Ivanovski**, Ljupcho Panovski, and Lina J. Karam, "Robust Super-Resolution based on Pixel-Level Selectivity," SPIE Electronic Imaging, Visual Communications and Image Processing, Jan. 2006.

116. **Rony Ferzli** and Lina J. Karam, "No-Reference Objective Wavelet-Based Noise Immune Image Sharpness Metric," *IEEE International Conference on Image Processing (ICIP)*, vol. 1, pages 405 – 408, Sep. 2005.

117. Christian Beaudry, Michael E. Berens, **Tarek El Doker**, Anna M. Joy, Lina J. Karam, Zoé Lacroix, **Jad A. Lutfi**, **Sai Motoru**, Rosemary A. Renaut, and **Ian J. Rich**, "Automated Characterization of Cellular Migration Phenomena*," IEEE International Computational Systems Bioinformatics Conference (CSB)*, pages 185-186, Aug. 2005.

118. **Zoran Ivanovski**, Lina J. Karam, and Glen P. Abousleman, "Super-Resolution Video Enhancement based on a Constrained Set of Motion Vectors," *Proceedings SPIE 5817, Defense and Security Symposium, Visual Information Processing XIV*, Proceedings SPIE vol. 5817, pp. 124-132, Apr. 2005.

119. **Zoran Ivanovski**, Ljupcho Panovski, and Lina J. Karam, "Efficient Edge-Enhanced Super-resolution," *3rd International Conference Sciences of Electronic, Technologies of Information and Telecommunications (SETIT)*, Tunisia, Mar. 2005.

120. **Zoran A. Ivanovski**, Lina J. Karam, and Glen P. Abousleman, "A Motion-Augmented Super-Resolution Scheme for Very Low Bit-Rate Video Enhancement," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 2, pp. 613-616, Mar. 2005.

121. **Rony A. Ferzli**, Lina J. Karam, and Jorge Caviedes, "A Robust Image Sharpness Metric Based on Kurtosis Measurement of Wavelet Coefficients", *1st International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM05,* ISBN: 09774739*)*, Scottsdale, AZ, Jan. 2005 (invited paper), electronic proceedings at http://enpub.eas.asu.edu/resp//vpqm2006/accepted_papers_vpqm05.htm.

122. **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.

123. **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.

124. **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.

125. **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.

126. **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.

127. **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.

128. **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.

129. **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.

130. **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.

131. **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.

132. **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.

133. **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.

134. **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.

135. **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.

136. 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.

137. **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.

138. **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.

139. **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.

140. **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.

141. **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.

142. **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.

143. **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.

144. **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.

145. **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.

146. **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.

147. **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.

148. **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.

149. **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.

150. 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.

151. **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.

152. **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.

153. **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.

154. 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.

155. **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.

156. **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.

157. 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.

158. 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.

159. Glen P. Abousleman, **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.

160. **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.

161. **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.

162. **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.

163. **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.

164. **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.

165. **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.

166. **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.

167. **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.

168. **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.

169. **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.

170. **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.

171. **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.

172. 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.

173. 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.

174. 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.

175. 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.

176. 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.

177. 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.

178. 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.

179. 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.

180. 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.

OPEN ACCESS ARXIV PAPERS

Note: Student authors are shown in boldface.

1. **Yingpeng Deng** and Lina J. Karam, “Learning-based Compression for Material and Texture Recognition,” arXiv:2104.10065, April 2021. Available Online at: https://arxiv.org/abs/2104.10065

2. **Yingpeng Deng** and Lina J. Karam, "Towards Imperceptible Universal Attacks on Texture Recognition," arXiv:2011.11957, Nov. 2020. Available Online at: https://arxiv.org/abs/2011.11957

3. **Yingpeng Deng** and Lina J. Karam, "A Study for Universal Adversarial Attacks on Texture Recognition," arXiv:2010.01506, Oct. 2020. Available Online at: https://arxiv.org/abs/2010.01506

4. **Tejas Borkar**, Felix Heide, and Lina Karam, "Defending Against Universal Attacks Through Selective Feature Regeneration," arXiv:1906.03444, June 2019. Available Online at: https://arxiv.org/abs/1906.03444

5. **Yingpeng Deng** and Lina J. Karam, "Frequency-Tuned Universal Adversarial Attacks" arXiv:2003.05549, March 2020. Available Online at: https://arxiv.org/abs/2003.05549

6. **Charan D. Prakash** and Lina J. Karam, "It GAN DO Better: GAN-based Detection of Objects on Images with Varying Quality," arXiv:1912.01707, Dec. 2019. Available Online at: https://arxiv.org/abs/1912.01707

7. **S. Alireza Golestaneh** and Lina Karam, "Synthesized Texture Quality Assessment via Multi-scale Spatial and Statistical Texture Attributes of Image and Gradient Magnitude Coefficients," arXiv:1804.08020, Apr. 2018. Available Online at: https://arxiv.org/abs/1804.08020

8. **Aditee Shrotre** and Lina Karam, "Full Reference Objective Quality Assessment for Reconstructed Background Images," arXiv:1803.04103, March 2018. Available Online at: https://arxiv.org/abs/1803.04103

9. Lina Karam, **Tejas Borkar**, Yu Cao, and Junseok Chae, "Generative Sensing: Transforming Unreliable Sensor Data for Reliable Recognition," arXiv:1801.02684, Jan 2018. Available Online at: https://arxiv.org/abs/1801.02684

10. **Milind S. Gide** and Lina J. Karam, "A Locally Weighted Fixation Density-Based Metric for Assessing the Quality of Visual Saliency Predictions," arXiv:1708.00169, Aug. 2017. Available Online at: https://arxiv.org/abs/1708.00169

11. **S. Alireza Golestaneh** and Lina J. Karam, "Spatially-Varying Blur Detection Based on Multiscale Fused and Sorted Transform Coefficients of Gradient Magnitudes," arXiv:1703.07478, March 2017. Available Online at: https://arxiv.org/abs/1703.07478

12. **Samuel Dodge** and Lina J. Karam, "Can the early human visual system compete with Deep Neural Networks?," arXiv:1710.04744, Oct. 2017. Available Online at: https://arxiv.org/abs/1710.04744

13. **Samuel Dodge** and Lina J. Karam, "A Study and Comparison of Human and Deep Learning Recognition Performance Under Visual Distortions," arXiv:1705.02498, May 2017. Available Online at: https://arxiv.org/abs/1705.02498

14. **Tejas Borkar** and Lina J. Karam, "DeepCorrect: Correcting DNN models against Image Distortions," arXiv:1705.02406, May 2017. Available Online at: https://arxiv.org/abs/1705.02406

15. **Samuel Dodge** and Lina J. Karam, "Quality Resilient Deep Neural Networks," arXiv:1703.08119, Mar. 2017. Available Online at: https://arxiv.org/abs/1703.08119

16. **Samuel Dodge** and Lina J. Karam, "Visual Saliency Prediction Using a Mixture of Deep Neural Networks," arXiv:1702.00372, Feb. 2017. Available Online at: https://arxiv.org/abs/1702.00372

17. **Milind S. Gide**, **Samuel F. Dodge**, and Lina J. Karam, "The Effect of Distortions on the Prediction of Visual Attention," arXiv:1604.03882, April 2016. Available Online at: http://arxiv.org/abs/1604.03882

18. **Samuel Dodge** and Lina Karam, "Understanding How Image Quality Affects Deep Neural Networks," arXiv:1604.04004, April 2016. Available Online at: https://arxiv.org/abs/1604.04004

19. **Samuel F. Dodge** and Lina J. Karam. "Is Bottom-Up Attention Useful for Scene Recognition?" arXiv:1307.5702, July 2013. Available Online at: https://arxiv.org/abs/1307.5702

20. **Akshay Pulipaka**, Patrick Seeling, Martin Reisslein, and Lina J. Karam, "Traffic and Statistical Multiplexing Characterization of 3D Video Representation Formats (Extended Version)," arXiv:1311.5834, Nov. 2013. Available Online at: https://arxiv.org/abs/1311.5834

STUDENTS' THESES AND DISSERTATIONS SUPERVISED TO COMPLETION

Ph.D. Graduates (24)

Dr. Tejas Borkar
Date: July 2020
Thesis Title: Robust Deep Learning Through Selective Feature Regeneration
Affiliation: Motional, Tempe, AZ

https://www.linkedin.com/in/tejasborkar/

Dr. Charan Prakash
Date: April 2020
Thesis Title: Robust Object Detection Under Varying Illuminations and Distortions
Affiliation: Apple, San Jose, CA
https://www.linkedin.com/in/charan-dudda-prakash/

Dr. Bashar Haddad
Date: May 2019
Thesis Title: BagStack Classification for Data Imbalance Problems with Application to Defect Detection and Labeling in Semiconductor Units
Affiliation: Verra Mobility, AZ; Intel, Chandler, AZ (current)
https://www.linkedin.com/in/basharhaddad1985/

Dr. Samuel Dodge
Date: December 2018
Thesis Title: Tree-Based Deep Mixture of Experts with Applications to Visual Saliency Prediction and Quality Robust Visual Recognition
Affiliation: Clarifai, Silicon Valley, USA; Apple, San Jose, CA (current)
https://www.linkedin.com/in/sam-dodge-68788a45/

Dr. Jinane Mounsef
Date: December 2018
Thesis Title: Distortion Robust Biometric Recognition
Affiliation: Assistant Professor, Rochester Institute of Technology, Dubai, UAE
https://www.linkedin.com/in/jinane-mounsef-biri-a7578750/

Dr. S. Alireza Golestaneh
Date: May 2018
Thesis Title: Visual Quality Assessment and Blur Detection Based on the Transform of Gradient Magnitudes
Affiliation: Carnegie Mellon University, Robotics Institute, Pittsburgh, PA; Bosch Center for Artificial Intelligence (current)
https://www.linkedin.com/in/alireza-golestaneh-943b3555/

Dr. Jinjin Li
Date: May 2017
Thesis Title: Locally Adaptive Stereo Vision Based 3D Visual Reconstruction
Affiliation: Amazon Research Labs, San Jose, CA
https://www.linkedin.com/in/jinjin-li-19232492/

Dr. Milind Gide
Date: December 2016
Thesis Title: Subjective and Objective Evaluation of Visual Attention Models
Affiliation: Edge 3 Technologies, Tempe, AZ; Apple, San Jose, CA (current)

https://www.linkedin.com/in/milindgide/

Dr. Tong Zhu
Date: May 2016
Thesis Title: Perceptual-Based Locally Adaptive Noise and Blur Detection
Affiliation: Apple, San Jose, CA
https://www.linkedin.com/in/tongzhu1/

Dr. Mahesh Subedar
Date: December 2015
Thesis Title: Visual Quality with a Focus on 3D Blur Discrimination and Texture Granularity
Affiliation: Intel, Chandler, AZ
https://www.linkedin.com/in/mahesh-subedar-55126b6/

Dr. Qian Xu
Date: December 2014
Thesis Title: Spatial and Multi-Temporal Visual Change Detection with Application to SAR Image Analysis
https://www.linkedin.com/in/qian-xu-845a966a/

Dr. Srenivas Varadarajan
Date: May 2014
Thesis Title: Texture Structure Analysis
Affiliation: Qualcomm, USA; NVIDIA, USA; Intel, USA; Intel Labs, India; Samsung R&D Center, India (current)
https://www.linkedin.com/in/srenivas-varadarajan24/

Dr. Akshay Pulipaka
Date: December 2012
Thesis Title: Traffic Characterization and Modeling of H.264 Scalable & Multi-View Encoded Video
Affiliation: Cinova, USA; Fullscreen Media, USA; Pluto TV, USA; NFL, USA (current)
https://www.linkedin.com/in/akshaypulipaka/

Dr. Nabil Sadaka
Date: December 2011
Thesis Title: Efficient Perceptual Super Resolution
Affiliation: Intel, Chandler, AZ
https://www.linkedin.com/in/nabil-sadaka-060a7b13/

Dr. Asaad F. Said
Date: December 2010
Thesis Title: Noise Resilient Image Segmentation and Classification Methods with Applications in Biomedical and Semiconductor Images

Awards: Joe Palais Outstanding Doctoral Dissertation Award; Intel Division Award
Affiliation: Intel, Chandler, AZ
https://www.linkedin.com/in/asaad-f-said-643b9813/

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, USA; Barrow Neurological Institute, AZ; Phoenix Children's Hospital, AZ; Philips, USA (current)
https://www.linkedin.com/in/ryan-robison-1b638520/

Dr. Wei-Jung Chien
Date: February 2009
Thesis Title: Rate-Distortion Based Adaptive Distributed Video Coding
Affiliation: Qualcomm, San Diego, CA
https://www.linkedin.com/in/wei-jung-chien-9b353613/

Dr. Rony Ferzli
Date: November 2007
Thesis Title: Perceptual Based Image Quality Assessment and Enhancement
Affiliation: Microsoft, Seattle, WA; Intel, Chandler, AZ
https://www.linkedin.com/in/rony-ferzli-134b4a1/

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
https://www.linkedin.com/in/tuyet-trang-snow-lam-7424041/

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: Professor, Faculty of Engineering, University of Ss. Cyril and Methodius, Skopje, Macedonia, http://dsp.feit.ukim.edu.mk/ZoranIvanovski.htm
https://www.linkedin.com/in/zoran-ivanovski-1a40461/

Dr. Zhen Liu
Date: December 2003

Thesis Title: Context-based and Perceptual-based Image Coding with Applications to JPEG2000
Affiliation: Qualcomm, San Diego, CA
https://www.linkedin.com/in/zhen-liu-1504bab/

Dr. Yassin Hasan
Date: December 2000
Thesis Title: Nonlinear Shape-Based Image Analysis and Coding
Affiliation: **Associate Professor**, Assiut University, Assiut, Egypt

Dr. Ingo Höntsch
Date: August 1999
Thesis Title: Adaptive Perceptual Coding of Visual Information
Affliliation: Institut Fur Rundfunktechnik (IRT), Germany; BFE, Germany; Avid, Germany; ARRI, Germany (current)
https://www.linkedin.com/in/ingo-hontsch/

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, and Chair of Automation and Computer Engineering Program, Politecnico di Bari, Bari, Italy, and CEO, APulia Intelligent Systems, Italy.
https://www.linkedin.com/in/francescomaria-marino-b5676a24/

M.S. Graduates (23)

Sai Prajwal Kotamraju
Date: December 2018
Thesis Title: Performance Evaluation of Object Proposal Generators for Salient Object Detection
Affiliation: Co-Founder and Head of Computer Vision, Automotus, Los Angeles, CA
https://www.linkedin.com/in/prajwal-kotamraju-55361194/

Vinay KashyapTakmulPurushothamaRaju
Date: December 2014
Thesis Title: Fisheye Camera Calibration and Applications
Affiliation: Intel, Chandler, AZ
https://www.linkedin.com/in/vinay-kashyap-2890/

Tejas Borkar
Date: December 2013
Thesis Title: Automated Animal Coloration Quantification in Digital Images using Colors and Skin Classification

Affiliation: Pursued PhD studies at ASU; Motional, Tempe, AZ (current)

Charan Prakash
Date: Spring 2012
Thesis Title: Camera Calibration using Adaptive Segmentation and Ellipse Fitting for Localizing Control Points
Affiliation: Pursued PhD studies at ASU; Apple, San Jose, CA (current)

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; Dolby Laboratories, USA (current)
https://www.linkedin.com/in/sundaramvijay/

Adithya Murthy
Date: May 2010
Thesis Title: Matlab Based Framework for Image and Video Quality Evaluation
Affiliation: Intel, Chandler, AZ ; Qualcomm, San Diego, CA (current)

Vicente Molieri
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, AZ; Fujitsu, AZ; Intel, AZ; CoreKinect, AZ (current)
https://www.linkedin.com/in/chris-burns-57554616b/

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
Affiliation: Co-Founder, AI Lab, Lebanon (current); Lecturer, AUB and LAU, Lebanon (current)

Berkay Kanberoglu

Date: December 2008
Thesis Title: Novel Tools and Techniques in Neurosurgical Planning
Affiliation: Pursued PhD at ASU; Intel, Chandler, AZ; Samsung Research, USA (current)
https://www.linkedin.com/in/berkay-kanberoglu/

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; Apple, USA; Modsy, USA (current)
https://www.linkedin.com/in/brian-lenoski/

Houssam Abbas
Date: May 2006
Thesis Title: Analysis and Suppression of Mosquito Noise in Compressed Video using Optimized Epsilon-Filters
Affiliation: Intel, Chandler, AZ; Pursued PhD in CS at ASU; Postdoc at University of Pennsylvania; Assistant Professor, Oregon State University, USA (current)
https://www.linkedin.com/in/houssam-abbas-725642a/

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; Pursued PhD at ASU

Mahesh Subedar
Date: May 2004
Thesis Title: Scalable Embedded Region-Of-Interest based Image Coding
Affiliation: Intel, Chandler, AZ; Pursued PhD at ASU; Intel Labs, USA (current)

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; Pursued PhD at ASU; Keep, Tempe, AZ; Carvana, Tempe, AZ (current)
https://www.linkedin.com/in/charles-zhan-30ab074/

Lei Gao
Date: May 2002
Thesis Title: Error-Resilient Image Coding and Transmission over Wireless Channels
Affiliation: Honeywell, Phoenix, AZ; Engineering Manager, General Electric – Aviation, USA (current)
https://www.linkedin.com/in/lei-gao-5b77494/

David Giguet
Date: December 2001
Thesis Title: Error-Resilient and Very Low Bit Rate Image Coding
Affiliation: Purple Labs, Chambery, France; SAGEMCOM, France; Avaya, France; Intel, France; Renault Software Labs, France (current)
https://www.linkedin.com/in/david-giguet-94915016/

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
https://www.linkedin.com/in/sumohana-channappayya-0bba33/

Mohamad Owais Osmani
Date: December 1999
Thesis Title: Object-based Processing
Affiliation: Intel, Chandler, AZ; Mentor Graphics, USA; Mythic, USA (current)
https://www.linkedin.com/in/owais-o-4155289/

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
https://www.linkedin.com/in/tuyet-trang-snow-lam-7424041/

INSTRUCTION

New Courses Developed

1. EEE 598 Deep Learning for Media Processing and Understanding (developed in Spring 2018 and offered yearly)

This is a four-credit graduate-level course that covers the fundamentals of deep learning with applications to media classification, processing, restoration, compression, and generation. Examples of media include image, video, text, speech, and audio. This course also includes hands-on assignments and projects in Python.
Some of the topics covered include:

- Basic Concepts in Machine Learning

- Probability Basics
- Motivation for Deep Learning
- Deep Feedforward Networks
- Regularization for Deep Learning
- Optimization for Training Deep Models
- Recurrent and Recursive Nets
- Autoencoders, Generative Models, Generative Adversarial Networks
- Applications: Computer Vision, Image Generation, Image Compression, Video Processing, Natural Language Processing

2. 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 assignemnts 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

3. 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

4. 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 Spectogram
- 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)

5. **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
   - 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