PERSONAL

Objective: Senior faculty/Academic leadership position

Nationality: Canadian

Additional Nationalities: US Permanent Resident Alien (Green Card Holder), Iraq

Contact Information

Residence:
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Work:
Professor Hussain Al-Rizzo
Systems Engineering Department, Office: EIT 520
George W. Donaghey College of Engineering and Information Technology
University of Arkansas at Little Rock
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URL: http://ualr.edu/systemsengineering/personnel/faculty/hussain-al-rizzo/

EDUCATION

Ph.D., Electrical Engineering (Highest Honors), 1992
Department of Electrical and Computer Engineering and Department of Geodesy and Geomatics Engineering, University of New Brunswick, Fredericton, NB, Canada. (*Won the nomination by the University of New Brunswick as the* "***Best Doctoral Graduate in Science and Engineering***")
(UNB is among the top universities in the world leading cutting-edge research and graduate education related to GPS)

Areas of Concentration: Wireless Communication Systems, Antennas and Propagation, Applied Computational Electromagnetics, Global Positioning System (GPS),

Graduate Courses:
EE 3221 *Digital Systems* II, EE 6543 *Estimation and Adaptive Filtering*, EE 6553 *Satellite Communications*, EE 6823 *Advanced Antenna Theory*, EE 6833 *Optical Signal Processing*, EE 6863 *Radar Systems*, EE 6883 *Microstrip Antennas*, EE 6593 *EMI-EMC Engineering*, SE 4253 *GPS Positioning*, SE 3122 *Advanced Adjustment Calculus*, SE 3032 *Astronomy*, ENGL 1013 **(GPA 4.3/4.3)**

Dissertation Title: *Electromagnetic Wave Scattering from 3-D Coated and Homogeneous Objects Using the Generalized Point Matching Technique and Generalized Multipoint Technique: Numerical Modeling and Applications*
Advisor: Professor Tranquilla James Marcus, Jr

M.Sc., Electronics and Communications (Highest Honors), 1983
Department of Electrical Engineering, University of Mosul, Mosul, Iraq

Areas of Concentration: Microwave Communication Systems, Electromagnetic wave Propagation and Scattering in Random Media (emphasis on sand and dust storms), Measurements of the Constitutive Parameters of Dielectric Materials at Microwave Frequencies

Graduate Courses:
Engineering Analysis, Micro-Electronics, Microwave Engineering, Advanced Digital Electronics, Advanced Numerical Analysis, Advanced Electronics Lab., Network Analysis & Synthesis, Applied Electromagnetic Fields, Advanced Communications Engineering, Advanced Communications Lab., Communication Theory **(Cumulative Average 86.7%)**

Master Thesis Title: *Effects of Sand and Dust Storms on Iraqi National Microwave Communications Links.*
Advisor: Professor Al-Hafid Hafid Taha

Postgraduate Diploma, Electronics and Communications (Highest Honors), 1981
Department of Electrical Engineering, University of Mosul, Mosul, Iraq

Diploma Thesis Title: *Investigation of the Solar Power Satellite System from the Perspective of Developing Countries*

B.Sc., Electronics and Communications (Highest Honors), 1979
Department of Electrical Engineering, University of Mosul, Mosul, Iraq.

RESEARCH EXPERIENCE IN ACADEMIA AND INDUSTRY

- Design of flexible artificial magnetic conductors and their applications to enhance the performance of low-profile UWB antennas, reduction of mutual coupling in antenna arrays for MIMO, GPS, cellular, and telemedicine applications.
- Design, fabrication, and testing of ultra-thin and compact inkjet-printed multiband antennas using flexible kapton substrates for wearable wireless devices and evaluating their performance under bending and twisting.
- Applications of electromagnetic band gap, microwave photonic and metamaterials structures to passive RF devices, reduction of mutual coupling between radiating elements in MIMO and antenna array systems, EMI/EMC and Simultaneous Switching Noise (SSN) reduction.

- Mutual coupling reduction in planar (conformal) and 3D antennas (with vertical extent) using novel planar soft electromagnetic structures.
- RF/Microwave carbon nanotube-based antennas and sensors.
- A systems engineering approach to the design and implementation of implantable and wearable wireless devices.
- Design of novel GPS antennas for multipath reduction and horizon-to-horizon coverage.
- Dynamic channel allocation and load balancing in large-scale WLAN systems.
- Wireless Networks, Wireless Sensor Networks, Multimedia Sensor Networks, Internet of Things (IoTs), Software Defined Networks.
- Wireless networks, wireless sensor networks, real-time systems, computer network protocols, multicast and Quality of Service issues.
- Advanced engineering electromagnetics, Computer-Aided Design (CAD) of guided-wave components, antennas, RF components and filters.
- Electromagnetic wave propagation and scattering in complex media.
- Design, simulation, analysis, prototyping, and testing of flexible, semi-flexible, and rigid antennas integrated with metamaterials, electromagnetic band gap, artificial magnetic conductors, and soft planar electromagnetic surfaces using conventional and inkjet printing technologies.
- Design of miniaturized antennas and wireless system modules for implantable (bio-compatible) and wearable devices.
- Reduction of mutual coupling between closely packed circularly-polarized planar antennas using novel defected ground structures.
- Low multipath GPS antennas using corrugated ground planes.
- Novel techniques for mutual coupling reduction between monopole and PIFA antenna elements.
- Dynamic optimization of access points and channels to minimize congestion, adjacent and co-channel interferences for indoor WLAN.
- Use of modern electromagnetic computational techniques to simulate high-power microwave interaction and transient-temperature profiles induced within lossy dielectric and magnetic materials.
- Development of novel conformal Finite-Difference Time Domain algorithms in Cartesian and Cylindrical coordinate systems to analyze geometrically composite structures with applications to single and multimode industrial-scale microwave processing applicators with temperature dependent electromagnetic and thermal constitutive parameters.
- Design of full-scale, industrial high-power microwave heating systems for processing of minerals, agricultural products, waste disposal, and wood products.
- Design, modeling, and testing of high-power microwave heating systems for extraction of heavy oil and tar sands.
- Development of new mineral processing methods for metal-containing ores or concentrates in a resonant microwave cavity.
- Modeling and simulation of the effects of precipitation on dual-polarized microwave and millimeter wave terrestrial and satellite communications systems.
- Field operation of GPS receivers, data processing, and accuracy assessments.

- Theoretical and experimental evaluation of the effects of the ionosphere, troposphere, and multipath on the performance of precise GPS pseudo-range and carrier-beat phase observations.
- Measurements of the electromagnetic constitutive parameters at microwave frequencies.
- Numerical modeling of electromagnetic wave scattering and absorption by arbitrarily shaped multilayered and homogeneous, perfectly conducting and dielectric objects using:
    - Analytical Methods
    - Generalized Point-Matching Technique
    - Generalized Multipole Technique
    - Extended Boundary-Condition Method
    - Method of Moments
    - Finite Element Method
    - Finite-Difference Time Domain Method

AREAS OF EXPERTISE

- Excellent background in analytical and numerical techniques applied to electromagnetic waves and microwave engineering problems (coaxial, waveguide, microstip, stripline, coplanar waveguide), antennas, filters, and frequency selective surfaces.
- In-depth knowledge and industrial experience in the design, characterization, manufacturing, and testing of passive microwave devices.
- Six-year industrial exposure and experience in patent law and intellectual property issues.
- Excellent background in metamaterials, artificial magnetic conductors, microwave photonics, defected ground structures, soft electromagnetic surfaces with applications to antenna design, mutual coupling reduction, filters, EMI/EMC and SSN reduction.
- Extensive industrial experience related to the design, manufacturing, control, and testing of single-mode and production-scale multi-mode microwave cavity structures.
- Excellent background in anechoic chamber design and related antenna testing.
- Excellent experience in CST's Microwave Studio and ANSYS's High Frequency Structure Simulator (HFSS).
- In-depth knowledge of GPS-related technologies: data processing and accuracy assessment.
- In-depth knowledge of Ground Penetrating Radar (GPR): signal processing, detection, and forward electromagnetic scattering models.
- In-depth knowledge of smart antenna technology; supervised and blind adaptive signal processing techniques.
- In-depth understanding of the various aspects of cellular and mobile wireless communication systems and networks: 4G/LTE, OFDM, MIMO, scheduling, multi-user detection, interference suppression, multipath, RAKE, equalization, and space-time signal processing.
- Development of novel pedagogy for teaching with technology by integrating commercial state-of-the-art simulation tools with traditional hardware-based laboratory in the teaching of electromagnetics and telecommunications.
- Extensive experience in curriculum development, assessment, and ABET accreditation.
- Excellent organizational, management, supervision, and leadership capabilities.

- Leadership positions in integrating international/intercultural dimension into teaching, research and service functions.
- Extensive experience in recruiting and retaining talented (undergraduate and graduate) international students and encouraging students from disadvantaged backgrounds to realize their potential.
- Continued high-level research activities, publications, and funded contracts and grants.
- Strategic technology planning.

PROFESSIONAL EXPERIENCE

ACADEMIC

August 2000-Present
Initial appointment at the rank of Associate Professor, promoted to Full Professor in Fiscal Year 2009
Systems Engineering Department, George W. Donaghey College of Engineering and Information Technology (EIT), University of Arkansas at Little Rock
International Student Advisor/Mentor
Founding Director of the UALR's Antennas and Wireless Systems Research Laboratory (AWSRL)

August 1998 - July 2000
Assistant Professor (Equivalent to Associate Professor in the North American System)
Electrical and Computer Engineering Department, Sultan Qaboos University, Muscat, Sultanate of Oman.
(Sabbatical leave from the University of New Brunswick and EMR Microwave Technology Corporation, Fredericton, NB, Canada.)

February 1992- July 1998
Research Associate, Radiating Systems Research Laboratory, Department of Electrical and Computer Engineering, University of New Brunswick, Fredericton, NB, Canada.

November 1987 - January 1992
Research and Teaching Assistant, Ph.D. Candidate, Radiating Systems Research Laboratory, Department of Electrical and Computer Engineering, University of New Brunswick, Fredericton, NB, Canada.
Instructed labs and assisted in teaching courses in Electric Circuits, Electronics, Antennas, Microwave Engineering, and Electromagnetic Fields and Waves.

June 1983 - October 1987
Research Associate, Electromagnetic Wave Propagation Department, Space and Astronomy Research Center, Scientific Research Council, Baghdad, Iraq.

January 1980 - May 1983

Research and Teaching Assistant, M.Sc. Candidate, Department of Electrical Engineering, University of Mosul, Mosul, Iraq.
Instructed labs and assisted in teaching courses in Computer Programming, Electric Circuits, Antennas, and Electromagnetic Fields.

INDUSTRIAL

March 1993 - July 1998
Senior Research Engineer, Patent Officer, and Manager of the Electromagnetic Group
EMR Microwave Technology Corporation, Fredericton, NB, Canada.
Spearheading the company's strategic and operational governance processes to achieve business goals by fostering a culture of innovation. Headed the design, manufacturing, and testing of microwave heating applicators. Coordinated the evaluation, deployment and management of infrastructure. Conducted design, modeling, simulations, prototyping, carried out tests and collected experimental results, wrote draft and worked with a patent attorney for two patents that appeared under the name of President and CEO of EMR.

May 1992 - February 1993
Research Engineer, Ocean Mapping Group, Geomatics and Geodesy Engineering Department, University of New Brunswick, Fredericton, NB, Canada.
Conducted proprietary innovative technology-based solutions utilizing digital signal processing and acoustic scattering from underwater objects to develop an approach for inferring seabed characteristics (topography, texture, and composition) using eight-channel acoustic radar.

TEACHING

UNDERGRADUATE

University of Arkansas at Little Rock

Courses (Developed) and Taught

- SYEN 2315 *Circuits and Systems*
- SYEN 2115 *Circuits and Systems Laboratory*
- SYEN 3350 *Signals and Systems*
- SYEN 3150 *Signals and Systems Laboratory*
- SYEN 3154 *Communications Systems Laboratory*
- SYEN 3352 *Analog and Digital Electronics*
- SYEN 3152 *Analog and Digital Electronics Lab*
- SYEN 3354 *Digital and Analog Communication*
- SYEN 3356 *Electromagnetic Fields and Waves*
- SYEN 4399 *Applications of Metamaterial in EMI/EMC and SSN Mitigation (Special Topics)*
- SYEN 4353 *Advanced Digital Communications*
- SYEN 4356 *RF Techniques and Systems*

- SYEN 4399 Advanced *Antennas for Wireless Systems (Special Topics)*
- SYEN 4358 *Cellular and Wireless Communications*
- SYEN 4385 *Systems Engineering Capstone Design I*
- SYEN 4386 *Systems Engineering Capstone Design II*
- SYEN 4399 *Mobile and Personal Communications Systems (Special Topics)*
- SYEN 4399 4G/5G Long Term Evolution (LTE) *(Special Topics)*

Laboratory (Developed) and Taught

- Circuits and Systems Laboratory (undergraduate)
- Signals and Systems Laboratory (undergraduate)
- Communication Systems Laboratory (undergraduate/graduate)
- Antennas and Wireless Systems Research Laboratory

Student Recruitment

- Recruited international undergraduate students supported by full scholarships at the George W. Donaghey College of Engineering and Information Technology, UALR.
- Recruited international Ph.D. and M.Sc. students supported by full scholarships in the graduate programs of the George W. Donaghey College of Engineering and Information Technology, UALR.
- Developed agreements and memorandum of understanding with universities in the Middle East for students'/faculty research and exchange.
- Developed and administered educational and research training programs for junior faculty and administrators from the Middle East and Africa through Fulbright grants.

Sultan Qaboos University

- MATH 1106 *Pre-calculus*
- ELEC 3111 *Electric Circuits I*
- ELEC 3511 *Electromagnetics I*
- ELEC 3522 *Electromagnetics II*
- ELEC 4325 *Electronics and Measurements Laboratory*
- ELEC 4615 *Electronics Laboratory*
- Developed and taught two electives, ELEC 5522 *Microwave Engineering I* and ELEC 5622 *Microwave Engineering II*

University of New Brunswick

- EE1713 *Electricity and Magnetism*
- EE2723 *Electrical Circuits, Systems, and Electronics*
- EE3811 *Electromagnetic Fields and Waves I*
- EE3822 *Electromagnetic Fields and Waves II*
- EE3833 *Electromagnetic Fields and Waves for Computer Engineering*

GRADUATE

University of Arkansas at Little Rock

Courses Developed and Taught

- SYEN 5353 *Advanced Digital Communications*
- SYEN 5399 *4G/5G Long Term Evolution (LTE) (Special Topics)*
- SYEN 7399 *Electromagnetic Waves and Antennas (Special Topics)*
- SYEN 5356 *RF Techniques and Systems*
- SYEN 7399 *Advanced Antennas for Wireless Systems (Special Topics)*
- SYEN 7385 *Systems Engineering Graduate Project II*
- SYEN 7300 *Systems Engineering Graduate Project I*
- SYEN 7101 *Research Methodology*
- SYEN 7399 *Electromagnetic Metamaterials (Special Topics)*
- SYEN 5399 *Applications of Metamaterial in EMI/EMC and SSN Mitigation (Special Topics)*
- SYEN 5399 *Mobile and Personal Communications Systems (Special Topics)*
- ASCI 7399 *Computational Electromagnetic: The Finite- Difference Time Domain Technique (Special Topics)*
- ASCI 7399 *Modeling and Simulation*

Sultan Qaboos University

- ELEC 6220 *Wireless Communications Systems*

University of New Brunswick

- EE6873 *Advanced Field Theory and Numerical Modeling of Guided Wave Structures*

GRADUATE RESEARCH ADVISING

University of Arkansas at Little Rock

Students Supervised/Supervising as Major Advisor

- Dr. Amer Al Habsi: *Spectrally Efficient Modulation and Turbo Coding for Communication Systems*, Ph.D.; graduated on December 2005, Assistant Professor, Sultan Qaboos University, Sultanate of Oman.
- Dr. Mohammad Haider: *Dynamic Channel Optimization and Access Point Selection for Wireless Local Area Networks*, Ph.D.; graduated on December 2007, Head of R&D Department/MW Expert, Mobinet, Lebanon.
- Rami Adada: *Design of Novel Antennas for Wireless Communications with Implantable Medical Devices*, Senior RF Engineer, Patriot Antenna System, Florida, USA.

- Yassin A. Al-Uraiby: *Design of Microstrip Antennas for WLAN and WiMax Networks*, M.Sc.; graduated on January 2010, Graduate Institute of Technology, University of Arkansas at Little Rock.
- Dr. Daniel Rucker: *A Systems Engineering Approach to the Design and Integration of Microstrip Antennas with Wearable Wireless Devices*, Ph.D.; graduated on May 2012, Systems Engineer at CymSTAR, LLC, Broken Arrow, Oklahoma, Airlines/Aviation.
- Dr. Taha A. Elwi: *Novel Antennas based on Innovations in Nano-Scale and Metamaterial Structures*, Ph.D.; graduated on May 2012, Assistant Professor, University of Baghdad, Baghdad, Iraq.
- Dr. Haidar Khalil: *Novel Metamaterial Based Antennas for Flexible Wireless Systems,* Ph.D.; graduated on May 2012, Assistant Professor, Xavier University, OH.
- Yhiea M.H Ai-Naiemy: *A Systematic Approach for the Design, Manufacturing, and Testing of Microstrip Antennas Using Ink-Jet Printing*, M.Sc.; graduated on May 2012, Lecturer, University of Diyala, Iraq.
- Dr. Said Abushamleh: *Mutual Coupling Reduction Between Closely Spaced Antennas Using Planar Soft/Hard Surfaces*, Ph.D.; graduated on May 2014, Postdoctoral Researcher, ECE, Advanced Radar Research Center, University of Oklahoma at Norman.
- Abdullah Najib Rajoub, M.Sc.; graduated on May 2015, Systems and Industrial Engineering Professional, Arkansas Children's Hospital, May 2015.
- Walid Shobaki, *Planning and Dimensioning LTE Networks Using ATOLL*, M.S.; graduated May 2015, AT&T, Little Rock, AR.
- Ayman Abbosh: *Novel Techniques for the Reduction of Mutual Coupling in Antenna Arrays*, PhD student; started 2010, Project Engineer, Molex Inc., Little Rock, AR.
- Ali Hammoodi, *Virtual Sequentially Rotated Microstrip Antenna Arrays*, PhD student; started Fall 2015.
- Charles E. Stanley, *A Study of Tapered Slot Antennas for use in Ultra Wide Band Astronomical Antenna Arrays*, M.Sc. Thesis, Fall 2015.
- Ahmed Mahdi, *Flexible Antennas for 4G/5G LTE Handsets*, M.Sc.; completed 2017.
- Abbas Al Wahamy, On the Modeling of Antenna Arrays for Massive MIMO Systems; started Fall 2016.

Funded Postdoctoral Research

- Supervised a one-year research project on *UWB Antenna Design* conducted by a postdoctoral fellow, Dr. Ahmed Shaheen, Associate Dean of Medical School, Misan University, Iraq.
- Principal faculty mentor, Technology, and Engineering cohort for of the Fulbright MENA Regional Short-Term Visiting Scholar Program in Science & Technology (MENA S&T), August 2011.
- Principal faculty mentor of seven junior faculty of the 2013 Iraqi Engineering cohort, Institute of International Education, Council for International Exchange of Scholars of the US State Department.

Students Supervised /Supervising as Graduate Committee Member

- Laura Stuart: *Underground Injection*, Applied Physics Program, Applied Science Department, M.Sc., Major Advisor: Dr. Hayder Al-Shukri, 2003.

- Shoaib Shajaat: *A Novel Power Control Scheme for CDMA Systems Using a Stochastic Differential Equations Approach*, M.Sc., Major Advisor: Dr. Sedick Djouadi, 2004.
- Dr. Anindo Roy: *Robust Stabilization of Multi-Body Biomedical Systems: A Control Theoretic Approach*, Ph.D., Major Advisor: Dr. Kamran Iqbal, 2005.
- Dr. Abbas Sámi Eyuboglu: *Ground Penetrating Radar: A Tool for Environmental and Geo-Technical Applications*, Ph.D., Major Advisor: Dr. Hayder Al-Shukri, 2005.
- Ryan Seal, *Multi-Channel Digital Receiver Data Acquisition System for the Arecibo Radar*, M.Sc., Major Advisor: Urbina Julio, 2006.
- Dr. Zafar Taha: *Coding/OFDM Communications Systems*, Ph.D., Major Advisor: Dr. Xian Liu, 2007.
- Gomathy Kumar: *Analysis of the Performance of IEEE 802.15.4 for Wireless Body Area Network*, M.Sc., Major Advisor: Dr. Seshadri Mohan, 2008.
- Dr. Basil Miller: *Application of Geophysical Analysis for Environmental and Geotechnical Problems*, Ph.D., Major Advisor: Dr. Hayder Al-Shukri, 2009.
- Dr. Shayma Jabir: *Efficient Deployment of Large-Scale MANETS*, Major Advisor: Dr. Srinivasan Ramaswamy, Ph.D., 2009.
- Dr. Okba R. Al Kadi: *Application of GPR for Archeological Exploration*, Ph.D., Major Advisor: Dr. Hayder Al-Shukri, 2011.
- Dr. Yasir Talib: Peak-to-Average *Power Ratio Reduction in OFDM Communications Systems*, Ph.D., Major Advisor: Dr. Seshadri Mohan, January 2011.
- Dr. Jerzy S Zielinski: *3D Digital Image Processing for Biofilm Quantification from Confocal Laser Scanning Microscopy*, Ph.D., Major Advisor: Dr. Nidhal Bouaynaya.
- Dr. Samir Abdulalmohson, *Organic /Inorganic Hybrid Structures and Their Applications in Solar Cells***,** Ph.D., Major Advisor: Dr. Jingbiao Cui, Physics Department, UALR, 2013.
- Dr. Ismaeel Akhlite, *Supermassive Black Hole Scaling Relations*, Ph.D., Major Advisor: Dr. Marc S. Seigar, Applied Science Ph.D. Program, UALR, 2014.
- Neslihan Bisgin, *Improving Fmeg Extraction, Detection and Validation*, Ph.D., Major Advisor: Dr. Kamran Iqbal, 2015.
- Wissam Alobaidi, Doctoral Candidate, *Applications of Microwave Technology for the Detection of Defects in Oil and Natural Gas Pipes*, Ph.D., Major Advisor: Dr. Eric Sandgren, 2013.
- Khalid Ali Aljabori, Doctoral Candidate, *Hydrodynamic of Multiphase Upflow in Packed Bed Reactor*, Ph.D. Thesis, Major Advisor: Dr. Eric Sandgren, 2013.
- Rohit Sharma, *Cognitive Radio Networking with Relay for Information Transmission*, M.Sc., May 2015, Major Advisor: Dr. Seshadri Mohan.
- Lena Abu Ennab, *Developing Pavement Performance Prediction Models for the State of Arkansas*, M.Sc., Major Advisor: Dr. Eric Sandgren, May 2015.
- Onur Kececi, *Harnessing the Transient Sound Waves in Space Repository for Source Identification*, M.Sc., Major Advisor: Dr. Coskun Bayrak, May 2015.
- Salim Al-Ali, *Human Action Recognition in Multimedia Videos Using Space-Time Approach Based on Contour, Silhouette, Motion and Combined Features*, Ph.D., Major Advisor: Mariofanna Milanova, May 2015.

- Babajide Adejumobi, *Provisioning Rural Wireless Broadband: A Prototype Implementation with Cognitive Radio Technology*, M.Sc., Major Advisor: Seshadri Mohan, May 2014.
- Dr. Rui Zhu, *Microstructure Design and Experimental Characterization of Functional Elastic Metamaterials*, Ph.D., Major Advisor: Guoliang Huang, December 2013.
- Hacer Varol, *Targeting Breast Cancer Detection with Communications Technology*, M.Sc., Major Advisor: Dr. Nidhal Bouaynaya, 2011.
- Bilal Al-Doori, Doctoral Candidate, *Power Efficient LTE Scheduling*, Ph.D. Thesis, Major Advisor: Xian Liu, 2015.
- Ahmed Abbas, Doctoral Candidate, *Thermal Simulations in Advanced Power Systems*, Major Advisor: Jing Zhang
- Yangyang Chen, Doctoral Candidate, *Theoretical Modeling and Design of Membrane-type Acoustic Metamaterials*, Ph.D. Thesis, Major Advisor: Guoliang Huang, 2015.
- Muhammad Baig Awan, Doctoral Candidate, *Impairment Aware Routing and Wavelength Assignment in Optical Networks Using Cross-Layer Communication*, Major Advisor: Seshadri Mohan, 2014.
- Aqiel Almamori, Doctoral Candidate, *Enhancing Spectral Utilization of 5G with Massive MIMO*, Major Advisor: Dr. Seshadri Mohan, 2015.
- Gourisetti Gupta, Doctoral Candidate, *A Novel Cybersecurity Framework to Enhance Cyber-Physical Security of Connected Smart Grid Critical Infrastructure using Blockchain Technology*, Major Advisor: Dr. Hirak Patangia, 2014.
- Chary Akmyradov, Doctoral Candidate, THE EPSILON-SKEW EXPONENTIATED BETA DISTRIBUTION, Major Advisor: Hassan Elsalloukh, Professor of Statistics, Completed May 2018.
- Tolgahan Cakaloglu, Optimization of search mechanisms using e-learning, Doctoral Candidate, Major Advisor: Xiaowei Xu.
- Yasir Ismael Al-Rikabi , The Fabrication and Characterization of Cu(In,Ga)Se2 Solar Cell, Major Advisor: Tar-pin ChenGraduated May 2018.

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University of New Brunswick

- Kenneth G. Clark: *The Finite-Difference Time-Domain Technique Applied to the Drooped Microstrip Antenna*, Ph.D. Thesis, July 1996.
- H Y Zedan: *Design and Analysis of Rectangular Waveguide Applicators Using the Finite Difference Time Domain Method*, M.S. Thesis, August 1998.
- Feng Ma: *Electromagnetic Modeling of Composite Cylindrical Applicator Geometries Using a Novel Cartesian-Cylindrical Hybrid Finite-Difference Time Domain Method*, Ph.D. Thesis, September 1999.

RESEARCH

University of Arkansas at Little Rock

Research Laboratory Development

Antennas and Wireless Systems Research Laboratory (AWSRL): The AWSRL is equipped with two Agilent network analyzers, spectrum analyzer, DMP-2831 materials deposition system printer, anechoic chamber (400 MHz - 40 GHz), dosimetric testing equipment, dielectric probe, and phantom head model. In addition, the laboratory is equipped with multiprocessor server, powerful, state-of-the-art computer facilities and simulation tools: Zeland's IE3D and Fidelity; CST's Studio Suite; Matlab; HFSS of ANSYS; SEMCAD; IMTS's EMPIRE; and Prop Lab.

GPS/Remote Sensing (RS)/GIS Laboratory (in collaboration with Drs. Yupo Chan, Kamran Iqbal, and Hayder Al Shukri): The laboratory includes near real-time satellite image processing, GPS tracking system for transportation, earth magnetic field measurements equipment, and GIS application capabilities.

Ongoing Research Projects

- Applications of Artificial Magnetic Conductors in Flexible Wireless Systems
- Applications of Metamaterials in EMI/EMC Problems
- Mutual Coupling Reduction Between Closely Spaced Antennas Using Novel Metasurfaces, Defected Ground Structures, and Planar Soft Electromagnetic Surfaces
- Carbon Nanotube-Based RF Antennas and Wireless Sensors
- Effects of Bending and Twisting on Flexible Antennas and passive RF components
- Circularly Polarized Microstrip Antennas for High Gain and Uniform Hemispherical Coverage
- Design of Compact Antennas and Wireless Systems for Implantable/Wearable Medical Devices
- Wireless Electroencephalogram Electrode

University of New Brunswick

- Development of analytical and computer-aided numerical techniques for the analysis of electromagnetic wave radiation, propagation, and radar scattering
- Design, analysis, and testing of drooped microstrip antennas and choke-ring ground planes for the control of multipath in precise GPS applications
- Interaction of EM waves with biological media
- Development of novel electromagnetic and thermal modeling techniques for the in situ the recovery of oil from tar sand using high-power microwave heating technology

EMR Microwave Technology Corporation (Proprietary Research and Production-Scale Marketing Completed)

- Development of new processes to enhance the extraction efficiency and processing costs of heavy oil, minerals, and refractory gold utilizing high-power microwave energy.
- Modeling and design of microstrip antennas for GPS and aerospace applications.
- Design, testing, and implementation of a modern laboratory at the EMR commercial test facility including, in particular, the design of 2.5 to 75 kW, 915 MHz industrial microwave heating applicators and the associated instrumentation and computer control equipment.
- Developed a full-wave computer code for the evaluation of the volumetric microwave-induced heating as a part of a modern multiphase heavy oil and oil sands reservoir model including a FDTD algorithm for a slotted waveguide applicator and the solution of the associated electromagnetic propagation/thermal problem.

Space and Astronomy Research Center, Scientific Research Council

- Theoretical modeling and experimental investigation of the effects of sand and dust storms on the performance of terrestrial and satellite communications systems in Iraq.
- Manager of the technical group responsible for the operation, maintenance, and development of the millimeter wave receiver's front end of the Iraqi National Radio Astronomical Observatory.

RESEARCH GRANT AND CONTRACTS

University of Arkansas at Little Rock

Curricula/Laboratory Development (Granted)

1. Principal Investigator: "Recruitment of students from the Iraqi Kurdistan region," UALR's Middle Eastern Studies Grant, UALR Political Science Department, $15,000, July, 2011.
2. Principal Investigator: "Development of a Virtual Wireless Telecommunications Laboratory: A Systems Engineering Approach," Ansoft Corporation, $5,000 summer stipend. Ansoft donated their full software products for the design of high-frequency systems with a commercial value of $3,483,928 of licenses, April 27, 2003.
3. Principal Investigator: "A Proposal for a Graduate Program in Systems Engineering at the Donaghey Cyber College," George W. Donaghey College of Engineering and Information Technology, October 2, 2004.
4. Principal Investigator: "An Innovative Virtual-Based Class in Undergraduate Electromagnetics Utilizing Computer-Based Simulations and Visualization Tools," University of Arkansas at Little Rock 2001 Faculty Grant Programs, March 23, 2001-April 23, 2002, $6,800.
5. Principal Investigator: "Development of Applied Electromagnetics and Wireless Communications Laboratory in the Department of Systems Engineering," George W. Donaghey College of Engineering and Information Technology, February 2001, $51,559.

6. Principal Investigator: (Co-PI's: Dr. Yupo Chan, Hayder Al Shukri, and Kamran Iqbal) "Development of GPS/RS/GIS Laboratory at the University of Arkansas at Little Rock," George W. Donaghey College of Engineering and Information Technology, February 2001, $84,000.
7. Principal Investigator: "A Proposal to the Shortage of Graduate Students," George W. Donaghey College of Engineering and Information Technology, October 2000, $10,000.
8. Principal Investigator: "A Proposal for Recruiting Undergraduate/Graduate Students from the United Arab Emirates (UAE)," George W. Donaghey College of Engineering and Information Technology, October 2000, $5,000.

Curricula/Lab Development Grants (Unsuccessful)

1. Principal Investigator: NSF CCLI-Adaptation and Implementation, "An Undergraduate Laboratory for Electromagnetics Fields and Waves, Antennas and Propagation, RF Circuits and Systems," December 2, 2004, $199,999.
2. Co-Principal Investigator (PI: Dr. Mary Good, Co-PI's: Drs. Ningning Wu, Hussain Al-Rizzo, Steven Minisker, and Mr. Alfred Hampton), NSF CSEMS-CS, ENG&MATH SCHOLAR, "Rural Arkansas Information Technology Scholarships (RAITS) to Attend CyberCollege of Arkansas," January 28, 2004, $400,000.
3. Principal Investigator: NSF CCLI-Adaptation and Implementation, "An Interdisciplinary Simulation-Based Laboratory for Systems Engineering: Electromagnetics, Antennas, and Wireless Communications Undergraduate Teaching and Learning," December 4, 2003, $117,154.
4. Principal Investigator: NSF Combined Research and Curricula Development Grant, EEC-CRCD, "An Advanced Laboratory for the Simulation and Visualization of Experiments in Electromagnetic Waves and Antennas," July 7, 2003, $99,917.
5. Principal Investigator: NSF Combined Research and Curricula Development Grant, EEC-CRCD, "An Innovative Curriculum in Telecommunications Systems Engineering Utilizing Computer-Aided Modeling and Simulations: A Systems Engineering Approach," July 7, 2003, $965,991.
6. Principal Investigator: (Co-PI's: Drs. Yupo Chan, Kamran Iqbal, and Xian Liu), NSF Combined Research and Curricula Development Grant, EEC-CRCD, "Wireless Telecommunications and Networking: A Systems Engineering Approach," October 31, 2001, $499,841.
7. Co-Principal Investigator: (PI: Dr. Rama Reddy, Co-PI: Yupo Chan), NSF CCLI, "Development of Systems Engineering Courses, Curriculum, and Laboratory Improvement," May 2001, $500,000.
8. Principal Investigator: (Co-PI's: Drs. Yupo Chan, and Kamran Iqbal), University of Arkansas at Little Rock 2001 Faculty Grant Programs, "Enhancement of Undergraduate Instruction in Modern Telecommunications Systems Utilizing Computer-Aided Design and Visualization Tools," February 13, 2001, $5,900.
9. Principal Investigator: (Co-PI's: Drs. Yupo Chan, and Kamran Iqbal), Course Development Plan, University of Arkansas at Little Rock, "Enhancement of Undergraduate Electromagnetics Instruction Utilizing Computer-Based Simulations and Visualization Tools," November 2000, $19,500.

Research Grants (Granted)

1. Principal Investigator, Institute of International Education, Council for International Exchange of Scholars, Washington, DC, 2013 Iraqi Engineering cohort of Visiting Fulbright Scholars (CIES), July 2013-September 2013, $92,000.
2. Principal Investigator, Science, Technology, and Engineering cohort for the inaugural year of the Fulbright MENA Regional Short-Term Visiting Scholar Program in Science & Technology (MENA S&T), August 2011-February 2012, $36,000.
3. Principal Investigator, Co-PI: Dr. Abdulkareem Abd Ali Mohammed, Atmosphere and Space Science Center, Directorate of Space Technology & Communication, Ministry of Science and Technology, Baghdad, Iraq, "Integration of Ground and Space-Based Observations to Detect and Identify Sources of Sand and Dust Storms in Iraq," January 2011-January 2012, $150,000.
4. Principal Investigator, Co-PI: Dr. Sabah Nasir Hussein, College of Electrical & Electronic Techniques, Foundation of Technical Education, Baghdad, Iraq, Smart Current Sensor, May 2011-August 2011, $35,000.
5. Co-Principal Investigator (among six other faculty from UALR), "Infrastructure for Wireless, Nano-, Bio-, Info-Tech Sensors and Systems: Arkansas ASSET: Advancing and Supporting Science, Engineering and Technology," RII: Arkansas ASSET Initiative, EPS EPSCoR, NSF Program(s): RESEARCH INFRASTRUCTURE IMPROV, Award Number: 0701890, Initial Amendment Date: August 14, 2007, Latest Amendment Date: July 2, 2009, Start Date: August 15, 2007, Expires: March 31, 2011 (Estimated) NSF RII, September 2007- August 2010, $13,168,123.
6. Hussain Al-Rizzo, Remzi Seker, Mariofanna Milanova, Co-PIs, Srini Ramaswamy, (Principal Investigator): NSF, "Development of an Interdisciplinary Arkansas Emulation Laboratory," Aug 2006 – July 2009, $299,750.
7. Principal Investigator: Seed Grant, George W. Donaghey College of Engineering and Information Technology, "A Proposal for the Establishment of a Multidisciplinary Research in Antennas and Advanced Bio-Electromagnetic Modeling and Simulations Applied to Implantable Medical Devices," March, 2005, $10,000.
8. Principal Investigator: (Co-PI's: Drs. Yupo Chan, and Gary Anderson), DoD/DEPSCoR, US Army Research Office, "Spatio-Temporal Modeling Techniques for High-Resolution Direction-of-Arrival Determination in Smart Antenna Systems," Pre-proposal, July 15, 2001.
9. Principal Investigator: ORSP Seed Grant, "Development of Applied Computational Research at UALR for the Simulations of GPR Systems," February 20, 2001-February 20, 2002, $3,250.
10. Principal Investigator: (Co-PI: Dr. Kamran Equal), Arkansas Space Grant Consortium, Research Infrastructure Grant, "Smart Antenna Systems for Wireless Communications," October 2000-October 2001, $5,300.

Research Grants (Unsuccessful)

1. Co-Principal Investigator, PI Dr. Seshadri Mohan, "MRI: Development of a Novel Instrumentation for Nano-Structure Metamaterial Based Wearable and Virtual MIMO Wireless Systems," Proposal Number: 1040405, April 2010, NSF, MRI, $250,000.
2. Co-Principal Investigator, PI Dr. Abhijit Bhattacharyya, "MRI: Acquisition of a Fabrication and Characterization System for Multifunctional Thin Films and Nanostructured Materials," Proposal No: 1040401, Co-PI, April 21 2010
3. Srini Ramaswamy and Hussain Al-Rizzo, Senior Personnel, Remzi Seker, (Principal Investigator): NSF, "REU Site: Undergraduate Research in Information Assurance and Security," May 1 2007 – July 31 2009, $299,996.
4. Co-Principal Investigator, PI: Dr. Badeh Adada (Neurosurgeon): Seed Grant, University of Arkansas for Medical Sciences, "Wireless Subdural Electroencephalogram Electrode" University of Arkansas for Medical Sciences, $15,000, September 2005.
5. Co-Principal Investigator, Dr. Abhijit Bhattacharyya (Principal Investigator), NSF EPSCOR, "Nanotechnology-Based Sensing and Actuation Systems," $7,500,000, October 2005.
6. Principal Investigator: Seed Grant, George W. Donaghey College of Engineering and Information Technology, "Ultra Low-Power Wireless Radio Subtotal Electroencephalogram Electrode," November 29, 2005, $10,000.
7. Principal Investigator: Seed Grant, George W. Donaghey College of Engineering and Information Technology, "A Proposal for the Establishment of a Multidisciplinary Research in Wireless Communications and Networking Applied to Wireless e-Health Technologies," November 29, 2004, $10,000.
8. Principal Investigator: Seed Grant, George W. Donaghey College of Engineering and Information Technology, "A Proposal for the Establishment of a Multidisciplinary Research in High-Power Microwave Processing of Materials: System Design and Computer Simulation," November 29, 2004, $10,000.
9. Principal Investigator: (Co-PI's Drs. Robert Akl, Melissa Tooley, and Yupo Chan), NSF Division of Civil and Mechanical Systems, Infrastructure System Management and Hazard Response, "Network-Based Cellular Geolocation Technologies for Rural America," June 11, 2003, $99,917.
10. Principal Investigator: (Co-PI's: Drs. Yupo Chan, Kamran Iqbal, and Gary Anderson), "Adaptive Antenna Systems for Space-Time Portable Transceivers in Mobile Ad Hoc Networks," FY 2003 DoD/DEPSCoR Grant, US Army Research Office, 15 September, 2002, $400,000.
11. Co-Principal Investigator: (PI: Dr. Kamran Iqbal), "A Proposal for a Center for Complex Systems Research," James McDonnell Foundation, 13 March, 2002, $500,000.
12. Principal Investigator: (Co-PI's: Drs. Yupo Chan, and Gary Anderson), FY 2002 DoD/DEPSCoR Grant, US Army Research Office "Design of Smart Antenna Systems for Handheld and Vehicle-Mounted Mobile Handset," 13 September, 2001, $ 333,000.
13. Principal Investigator: (Co-PI's: Drs. Yupo Chan, and Kamran Iqbal), NSF and U.S. Department of Transportation, CMS Information Technology and Infrastructure System, "Wireless Geo-Location Technologies for Rural America," July 20, 2001, $99,893.
14. Co-Principal Investigator: (PI: Dr. Hayder Al Shukri), DoD/DEPSCoR, US Army Research Office, "Clutter Reduction in GPR Data due to 3-D Ground Surface Using the Finite-Difference Time-Domain Method," July 15, 2001.

15. Principal Investigator: ASTA, "Establishment of a Research Program in Microwave Processing of Materials at the University of Arkansas at Little Rock: Numerical Modeling, System Design and Computer Simulation," August 2001, $95,728, Declined due to Budget cuts.
16. Principal Investigator: (Co-PI: Dr. Aicha El Shabini, Electrical Engineering Department, University of Arkansas at Fayetteville), ASTA, "Multidisciplinary Approach to High-Power Microwave Processing of Materials: Numerical Modeling, System Design and Computer Simulations," February 13, 2001, $95,728.
17. Principal Investigator: ORSP Seed Grant, "Wide-Band Time Domain Electromagnetic Modeling of Objects under 3-D Randomly Rough Surfaces Using the Finite Difference Time Domain Method," October 16, 2000, $4,000.
18. Principal Investigator: ORSP Seed Grant, "A Novel Finite-Difference Time-Domain Modeling of an Aperture-Coupled TE_{10n} Rectangular Resonant Cavity Applicator for High-Power Microwave Processing," October 16, 2000, $4,000.
19. Principal Investigator: (Co-PI's: Drs. Yupo Chan, and Kamran Iqbal), Arkansas Space Grant Consortium and NASA/EPSCoR, "Design, Modeling and Implementation of Sensor Arrays for Smart Antenna Systems in Third-Generation Wireless Communications," September 2000, $325,141.

Sultan Qaboos University (Granted)

Principal Investigator: Sultan Qaboos University, "Survey of Electromagnetic Field Emissions in Close Proximity to Omani Broadcasting, Television and Mobile Base-Station Antennas," September 1999-July 2000, $35,000.

University of New Brunswick (Granted)

1. Principal Investigator: (Co-PI's: Drs. K. G. Clark, and J.M. Tranquilla), EMR Microwave Technology Corporation, "Finite-Difference Time Domain (FD-TD) Modeling of an Aperture Coupled TE_{10n} Resonant Cavity Applicator for High-Power Microwave Heating," April 1998- April 1999, $10,000.
2. Principal Investigator: (Co-PI's: Dr. J.M. Tranquilla, and Ma Feng), EMR Microwave Technology Corporation, "Development of Novel Electromagnetic/Thermal Finite-Difference Time Domain (FD-TD) Algorithms for the Analysis and Design of Geometrically-Composite High-Power Microwave Heating Applicators," September 1996- September 1999, $120,000.
3. Principal Investigator: (Co-PI's: Dr. J.M. Tranquilla, and H. Z. Younies), EMR Microwave Technology Corporation, "Electromagnetic Characterization of the Near-Field Radiation Characteristics of Slotted Rectangular Waveguides for High-Power Microwave Heating Using the Finite-Difference Time Domain (FD-TD) Method," May 1997- May 1998, $60,000.
4. Principal Investigator: (Co-PI: Dr. J.M. Tranquilla), NSERC, "A Rigorous Analysis of 3-D Electromagnetic Wave Scattering from Electrically Large Objects using the Generalized Multipole Technique," January 1994- January 1995, $50,000.
5. Co-Principal Investigator: (PI: Dr. J.M. Tranquilla, Co-PI: J. P. Carr), NSERC, "Design and Characterization of Ring Ground Planes for Multipath Control in Global Positioning System Applications," January 1993-January 1994, $25,000.

6. Principal Investigator: (Co-PI: Dr. J.M. Tranquilla), NSERC, "Theoretical and Experimental Investigation of GPS Precise Static Relative Positioning During Ice Clouds and Snowfall Periods," April 1992-April 1993, $50,000.
7. Principal Investigator: (Co-PI: Dr. J.M. Tranquilla), NSERC, "Three Dimensional Electromagnetic Wave Scattering from Dielectrically-Coated Axisymmetric Objects Using the Generalized Point-Matching Technique," January 1992-January 1993, $50,000.
8. Co-Principal Investigator: (PI: Dr. J.M. Tranquilla, Co-PI's: J.P. Carr, and K. G. Clark), NASA Jet Propulsion Laboratory, "Development of New Low-Cost GPS Antennas," April 1988- April 1990, $14,000.
9. Co-Principal Investigator: (PI: Dr. J.M. Tranquilla, Co-PI's: J.P. Carr, and K. G. Clark), Magnavox Advanced Systems (California), "Experimental Study of Global Positioning Satellite Antenna/Backplane Configurations," April 1988-April 1989, $20,000.

Scientific Research Council (Granted)

Principal Investigator: (Co-PI: Dr. S. A Abdullah), Iraqi National Research Council, "Effects of Sand and Dust Storms on Dual Polarized Terrestrial and Satellite Microwave and Millimeter Wave Communications Systems," April 1984- April 1986, $55,000.

SERVICE ON COMMITTEES

University of Arkansas at Little Rock

DEPARTMENTAL

- The Electrical and Computer Systems Engineering (ECSE) program committee
- Advisor for International Students and Faculty advisor/mentor for transfer undergraduate students
- ABET Task Force
- Curriculum Committee
- Annual Performance Evaluation
- Promotion and Tenure
- Systems Engineering Faculty Search

COLLEGE

- Secretary for the College Assembly
- Undergraduate Curriculum
- Faculty Excellence Award
- Project Management Certificate
- Leader of Education for the Working Professional
- Computational Science and Applied Computing Liaison
- Chair of the Computational Science Doctoral Program
- Telecommunications M.S. Concentration Committee, Applied Science Department

UNIVERSITY

- Traffic
- Graduate Council
- Academic Technology and Computing
- Ambassador for the Systems Engineering Department, Campus Campaign
- University-wide Wireless Networking Group
- Infrastructure Work Group of the Distance Education Advisory

Sultan Qaboos University

- Chair, Ad-hoc for reply to external examiner's report
- Coordinator, Examination
- Coordinator, Curriculum
- Chair, Curriculum Evaluation and Development Committee, Royal Omani Technical Air Force College
- Chair, Student/Staff Liaison
- Faculty Advisor for Undergraduate and Graduate Students
- Seminar Series
- Coordinator, Graduate Admission

RFEREEING/SERVICE TO THE PROFESSION

- "5G wireless communication systems: prospects and challenges", Session No 113, Organized by: International Conference on Communication, Management and Information Technology,
- Session Chair, MO-UB.2P: Reconfigurable Arrays, 2018 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, 8-13 July 2018 • Boston, Massachusetts
- ICCMIT 2018, Universidad Politecnica de Madrid, Madrid, Spain, Conference Date: April 2-4, 2018.
- Reviewed the book, Green Engineering: Innovation, Entrepreneurship and Design, CRC Press, by Riadh Habash, October 2017.
- Member of the Advisory Board, Journal of University of Babylon, Iraq.
- Member of the Advisory Board, Al-Khwarizmi Engineering Journal, Iraq.
- eTELEMED 2016 Technical Program Committee, The Eighth International Conference on eHealth, Telemedicine, and Social Medicine, eTELEMED 2016, April 24 - 28, 2016 - Venice, Italy
- Member of International Program Committee, The 1st International Workshop on Link- and System Level Simulations, IWSLS² 2016, Vienna, Austria, July 1, 2016, Institute of Telecommunications (ITC) at the TU Wien.
- Member of the External Advisory Committee 1st-IJRTESS-2017 (*2017 IEEE First International Conference on Recent Trends of Engineering Science and Sustainability*) [1st-ijrtess-2017], May 2017.
- Member of the External Advisory Committee, NTICT 2017 (*Annual Conference on New Trends in Information & Communications Technology Applications 2017*) [ntict2017], Baghdad, Iraq.
- Editor-in-Chief of the International Journal of Computing and Network Technology, 2012.

- Associate Editor, Journal of online Engineering Education, January 2011.
- Associate Editor, Journal of Advances in Electronics and Communications Engineering (JAECE), 2016.
- Member of the Editorial Board, Journal of Modeling and Simulation of Antennas and Propagation, 2016.
- Expert Judge, 2013 European Satellite Navigation Competition, Arab Middle East & North Africa (MENA).
- Member of The Network of Iraqi Scientists Abroad, NISA
- Member of the International Society of Iraqi Scientists
- UALR Academy for Teaching and Learning Excellence, ATLE event September 18th, 2014., Elements of Mentoring., Guest Speaker: Dr. Hussain Al-Rizzo
- Technical Program Committee, The Seventh International Conference on eHealth, Telemedicine, and Social Medicine, eTELEMED 2015, February 22 - 27, 2015 - Lisbon, Portugal
- Member of the External Advisory Committee, NSF HBCU-UP Phase II External Advisory Committee, Philander Smith College, Little Rock, AR, January 2013.
- Expert and Judge, Arab MENA Regional challenge to ESNC2012, European Satellite Navigation Competition, 2012.
- Reviewed *Microwave and RF Design: A Systems Approach 2nd Edition, Scitech Publishing; Engineering Electromagnetics*, 6th Edition, Hayt and Buck, McGraw Hill; *Principles of Electrical Engineering* 5/E, Rizzoni, McGraw Hill; and *Introduction to Wireless Communications*, Berry, Black, DiPiazza, Ferguson, and Voltmer, Pearson
- Reviewed a proposal submitted to the Ministry of Science and Technology, Baghdad, Iraq, to develop a Master Plan for Science and Technology in partnership with Ministry of Higher Education and UNESCO Under a project titled "Development of a Master Plan for Science Technology & Innovation (STI) in Iraq 2012-2016", 2012.
- External reviewer for the Killam Research Fellowships, Canada's most prestigious research honors awarded to established Canadian scholars who have demonstrated outstanding research ability and who have published the results of this research through substantial publications in their field, June 2012.
- Chair Section 5-9: Inkjet Design, Materials & Fabrication, 2nd Annual World Congress of Nano-S&T (Nano S&T-2012), October 26 to 28, 2012, Qingda.
- Session Chair, Electromagnetic Band Gap Devices, 2011 IEEE Intern. Symp. Antennas and Propagation and USNC/URSI Nat. Radio Science Meeting, Spokane, Washington, USA, 5-8 July, 2011.
- Member of the Technical Advisory Committee of the *International Microwave Power Institute*, three-year term starting on February, 2005.
- Chair of Track 2 (Algorithms, Methods, Simulation, and Software), *Wireless Telecommunications Symposium*, April 27 – 29, 2008, Cal Poly Pomona, elected for the same position for WTS 2009.
- Chair of Track 2 (Algorithms, Methods, Simulation, and Software), *Wireless Telecommunications Symposium*, April 27 – 29, 2007, Cal Poly Pomona.
- Chair of TPC 2007 IEEE International Conference on Signal Processing and Communications ICSPC, Dubai, UAE, 24-27 November 2007.

- Chair of TPC, ICC 2007 Communications QoS, Reliability and Performance Modeling Symposium.
- Chair of TPC International Conference on Mobile Computing and Wireless Communications M-WCMC 2007.
- Technical Program Committee Chair, Image and Speech Processing International Conference (SISPIC 2007), Petra/Jordan, 5-7 March 2007.
- Chair of Technical Program Committee, Communication Systems and Circuits International Conference (CSCIC 2007), Aqaba/Jordan, 28-31 January 2007.
- Delivered a seminar on *Advanced Channel Assignment and Load Balancing Techniques for WLAN*, Ajman University for Science and Technology, Ajman, UAE, December, 2007.
- Chair of TPC WEMIC 2006 (Wireless Euro-Mediterranean International Conference).
- TPC member and reviewer CHINACOM-Wireless Conference, 2006.
- Chair of TPC, MCWC 2006 Mobile Computing and Wireless Communications International Conference IASTED International Conference on Communication Systems and Networks (CSN 2006).
- Chair of Track 2 (Algorithms, Methods, Simulation, and Software), Wireless Telecommunications Symposium, April 27 – 29, 2006, Cal Poly Pomona.
- Delivered a seminar on *The Design of Antennas for Ultra Low Power Wireless Body Area Networks*, Etisalat College and Ajman University for Science and Technology, United Arab Emirates, March, 2006.
- Reviewer, IEEE International Conference on Communications ICC 2006, Istanbul, Turkey, 11-15 June, 2006, *Symposium on Next Generation Mobile Networks*.
- Session Chair, Reviewer, and Member of the Technical Program Committee, Wireless Euro-Mediterranean International Conference, March 27 – 29, 2006, Amman, Jordan.
- Reviewed proposals to the 2005 Armenian-U.S. Bilateral Grants Program of the U.S. Civilian Research and Development Foundation (CRDF), August 2005.
- Reviewed proposals for NSF Course, Curriculum, and Laboratory Improvement (CCLI) program, July 25-26, 2005.
- Developed a Joint Cooperative Bachelor Program between UALR and Al Ghurair University, Dubai, United Arab Emirates in Systems Engineering and Information Science, October, 2005.
- Participated in the 2004 ABET Commission, Nashville, TN, October 26, 2004.
- Delivered a short course on *Developing Undergraduate Wireless Communications Curriculum*, Dubai University College, Dubai, United Arab Emirates, November 30, 2004.
- Selected by the United Nations among other *nine* experts to deliver Communications Engineering and Satellite Communications courses for the 2004 Summer Faculty Development Seminar in Iraq, Institute of International Education, UN, May 28, 2004.
- Organized Workshop on *Incorporating Computational Science Tools and Techniques into Undergraduate Courses*, National Computational Science Institute, The Shodor Education Foundation Inc., 22-28 June, 2003, University of Arkansas at Little Rock.
- Session Chair, 9th IASTED International Conference on Signal and Image Processing SIP 2003, August 13-15. 2003, Honolulu. Hawaii.
- Reviewed the book, *Engineering Electromagnetics*, 6th Edition, Hayt and Buck, McGraw Hill, 2000
- Member of the Editorial Board of the Fifth International Symposium on Signal Processing and its Applications, ISSPA 99, 23-25 August 1999, Brisbane, Australia.

- Member of the Editorial Board of the Fifth International Conference on Communication, Computer and Power, ICCCP'98, 7-10 December 1998, Sultan Qaboos University, Muscat, Sultanate of Oman.
- Member of the International Advisory Committee of the International Wireless and Telecommunications Symposium, Shah Alam, Malaysia, 14-16 May 1997.
- Reviewed papers for the Journal of Communications Software and Systems (JCOMSS).
- Reviewed the book: Principles of Electrical Engineering 5/E, Rizzoni, McGraw Hill.
- Reviewed the book, Introduction to Wireless Communications, Berry, Black, DiPiazza, Ferguson, and Voltmer, Pearson.
- Reviewed papers for the Journal of Applied Optics.
- Reviewed papers for the IEEE APS Magazine.
- Reviewed papers for the Journal of Aerospace Engineering.
- Reviewed papers for the Journal of Microwave Power and Electromagnetic Energy.
- Reviewed papers for the J. Communications Software and Systems.
- Reviewed papers for the Iranian Journal for Electrical and Electronics Engineering.
- Reviewed proposals for the U.S. Civilian Research and Development Foundation (CRDF), U.S. State Department.
- Participated in the workshop on 3-D Visualization using CAVE Technology at the Virtual Reality Environmental Technologies Center (VETC), September 14-15, 2000, Ontario, Canada.
- Attended three-month intensive training program on the operation and maintenance of radio telescopes at MBB and KRUPP companies, Germany, May -July, 1984.
- Attended an intensive course on radio astronomy, Max-Planck Institute for Radio Astronomy, Bonn, Germany, July-August, 1984.

SHORT COURSES OFFERED

- Development of GPS-Based Vehicle Tracking System in the Sultanate of Oman, Ministry of Higher Education, Muscat, Sultanate of Oman, January, 2015.
- Intelligent GPS-Based Security System for Iraq, Salahaddin University-Erbil, July 2007.
- Reduction of EMI, EMC and Simultaneous Switching Noise Using Defected Ground Structures and Metamaterials, one-month intensive course delivered to engineers and managers at Molex, Little Rock, AR, 2010.
- Channel Assignment and Load Balancing for WLAN, Ajman University for Science and Technology, Ajman, UAE, December, 2007.
- Design of Antennas for Ultra Low Power Wireless Body Area Networks, Etisalat College and Ajman University for Science and Technology, United Arab Emirates, March, 2006.
- Developing Undergraduate Wireless Communications Curriculum, College of Information Technology, Dubai University College, Dubai, United Arab Emirates, November 30, 2004.
- The Global Positioning System, Sultan Qaboos University, Muscat, Sultanate of Oman, May 2000.
- Industrial Applications of High Power Microwave Heating, Sultan Qaboos University, Muscat, Sultanate of Oman, May 1999.

- The Global Positioning System, International Wireless and Telecommunications Symposium, Shah Alam, Malaysia, 14-16 May 1997.

COMPUTER/SOFTWARE SKILLS

Programming Languages:
Basic, FORTRAN, Assembly, C, C++, JAVA

Operating Systems:
MS-DOS, Macintosh, UNIX, WINDOWS, IBM Mainframes

Engineering Software Packages:

- CST Studio Suite (Microwave Studio, Design Studio, EM Studio), Computer Simulation Technology GmbH, Germany (Advanced level)
- High Frequency System Simulator (HFSS), High Frequency Designer, Maxwell 2-D, and Maxwell 3-D, Ansoft Corporation (Advanced level)
- SEMCAD by speag (Beginner's level)
- FEKO (Beginner's level)
- OptiFDTD (Beginner's level)
- CoWare (Beginner's level)
- VisSim (Beginner's level)
- Zeland's Fidelity and IE3D (Beginner's level)
- SystemView by Elanix (Beginner's level)
- Agilent's Advanced Design System (Beginner's level)
- EMPIRE by IMST (Beginner's level)
- EDX Tools for Wireless Design (Beginner's level)
- DIPOP (DIfferential POsitioning Program), Geodetic Research Lab., Geomatics and Geodesy Engineering Department, University of New Brunswick (Advanced level)
- 2-D MMP, Two-Dimensional Multiple Multipole Analysis Software and User's Manual, Ch. Hafner, Artech House, 1990 (Advanced level)
- The 3-D Electrodynamics Wave Simulator, 3-D MMP Software and User's Guide, Ch. Hafner and L. Bomholt, John Wiley, 1993 (Advanced level)
- The Electromagnetic Wave Simulator, A Dynamic Visual Electromagnetic Laboratory based on the Two-dimensional TLM Method, Wolfgang JR Hoofer and Poman P. M. So (Beginner's level)
- The T-Matrix (Extended Boundary-Condition Method) programs for determining the near-field and far-field scattering and absorption characteristics of general homogeneous and multi-layered dielectric particles, finite-thickness slab, and infinitely long dielectric circular cylinders, "Light Scattering by Particles: Computational Methods," P.W. Barber and S.C. Hill, Advanced Series in Applied Physics, World Scientific Publishing, 1990 (Advanced level)

- The Mini-Numerical Electromagnetic Code (MININEC) for analyzing the near-field and far-field radiation patterns of wire antennas (Beginner's level)
- The FORTRAN 3-D FDTD computer program of Karl S. Kunz and Raymond J. Lubbers, "Finite Difference Time Domain Method for Electromagnetic," CRC Press, 1993 (Advanced level)
- Ensemble, a software package based on an integral-equation/moment-method formulation for analyzing microstrip circuits and antennas on complex multilayered substrates, Boulder Microwave Technology, Inc., Colorado, USA (Advanced level)

HONORS & AWARDS

- UALR Graduation & Retention Advocate Award, 2013, and 2015, in Recognition of Dedicated Service and Honoring Graduation & Retention Advocacy.
- EIT College Excellence Award in Research, April 2009.
- **University of Arkansas at Little Rock Faculty Excellence Award in Research, May 2009.**
- EIT College Excellence Award in Teaching, April 2007.
- **Ted and Virginia Bailey Foundation, University of Arkansas at Little Rock Faculty Excellence Award in Teaching, May 2007.**
- Systems Engineering Department Teaching Award, April 2007.
- Teaching Distinction Award, Systems Engineering Department, May 2005 and May 2006.
- Listed in the *Marquis Who's Who in Science and Engineering*, 2005-2006, October, 2004.
- One-month research award, German Academic Exchange Service (DAAD), May 2000.
- Nominated by the University of New Brunswick as candidate for the Natural Sciences and Engineering Research Council (NSERC) doctoral prices, 1992.
- Won the nomination by the University of New Brunswick as the best doctoral graduate in Science and Engineering, 1992.
- University of New Brunswick, Graduate Fellowship, 1990.
- Ministry of Higher Education and Scientific Research, Baghdad, Iraq, Graduate Scholarship, 1987.
- First Honors Award for Senior with Highest Cumulative Average in the postgraduate program, College of Engineering, University of Mosul, 1983.
- First Honors Award for Senior with Highest Cumulative Average in the undergraduate engineering program, College of Engineering, University of Mosul, 1979.

PROFESSIONAL MEMBERSHIPS

- American Society for Engineering Education
- INCOSE, International Council for Systems Engineering
- Member of The Network of Iraqi Scientists Abroad, NISA
- Member of the International Society of Iraqi Scientists
- Materials Research Society
- International Microwave Power Institute

PUBLICATIONS

Patents:

1. Ayman A. Isaac, **Hussain Al-Rizz**o, Samer Yahya, Decoupled and de-scattered monopole MIMO antenna arrays with orthogonal radiation patterns and applications of same, U.S. Serial Number 62/555,928, Provisional Patent, September 8, 2017.

2. Ayman A. Isaac, **Hussain Al-Rizzo**, Samer Yahya, *Isolation of two wideband MIMO antenna arrays using novel decoupling structures and applications of same,* U.S. Serial Number 62/555,892", Provisional Patent, September 8, 2017.

3. Alexandru Biris, **Hussain Al-Rizzo**, Taha Elwi, Daniel Rucker, *Nano and micro based antennas and sensors and methods making same*, Nano and micro based antennas and sensors and methods of making same, US 20100097273 A1, Also published as US8692716, April, 2010.
4. Rami Adada, **Hussain Al-Rizzo**, *Circularly polarized microstrip antennas*, WO 2010115191 A1, Also published as US8466838, US20110025571, October, 2010.
5. Ayman Abbosh, and Hussain Al-Rizzo, *Novel Approach for the Reduction of Mutual Coupling Between Monopole Antennas,* September, 2015, pending.
6. Hussain Al-Rizzo, *Mutual Coupling Reduction Between Closely Spaced Circularly Polarized Planar Antennas,* September, 2015, pending.
7. Hussain Al-Rizzo, *Mutual Coupling Reduction Between Closely Spaced Monopole Antennas Using Planar Periodic Printed Metallic Structures*, September, 2015, pending.
8. Hussain Al-Rizzo, *Virtual Sequentially Rotated Antenna Array*, September, 2015, pending.
9. Hussain Al-Rizzo, *Single-Port Single Mode Cavity Resonators for Microwave Assisted Material Processing without the Use of a Short Circuiting Plunger*, January 2015, pending.
10. Hussain Al-Rizzo, *Adjustable Slotted Waveguide Antennas Using a Virtual Short Circuit*, January 2015.
11. Hussain Al-Rizzo, *A Novel Approach to Accelerate the Convergence of Time Domain Solvers of Maxwell's Equations for Highly Resonant Structures Using Dual Excitation*, January 2015, pending.

Submitted and executed the design, modeling, simulations, prototyping, and collected experimental results, wrote draft and worked with a patent attorney for the following two patents which later appeared under the name of James Tranquilla (President and CEO of EMR Microwave Technologies, Fredericton, NB, Canada):

1. Microwave Treatment of Metal Bearing Ores and Concentrates, Canadian Patent 2248889, EMR Microwave Technology Corporation, September 11, 1998.
2. Method For Microwave Induced Oxidation of Sulphidic Ore Material in Fluidized Bed Without Sulphur Dioxide Emissions, Canadian Patent 2263497, EMR Microwave Technology Corporation, March , 1998.

Technical Reports **(**Submitted to Ansoft Corporation, May 2004)

1. **H. M. Al-Rizzo**, and R. Seal: Design and optimization of wire antennas using HFSS.
2. **H. M. Al-Rizzo**, and R. Seal: TE_{10n} single-mode cavity resonator V1.0.
3. **H. M. Al-Rizzo**, and M. Haidar: Team benchmark problem 19: The TM_{010} cavity resonator: Parameterization and optimization.
4. **H. M. Al-Rizzo**, and M. Haidar: The rectangular patch antenna.
5. **H. M. Al-Rizzo**, and M. Haidar: The horn antenna.
6. **H. M. Al-Rizzo**, and M. Haidar: Design of a strip-line fed microstrip antenna using HFSS.
7. **H. M. Al-Rizzo**, and S. James: Ansoft's High Frequency Structure Simulator (HFSS) beginner's guide: Cylindrical cavity resonators (Parts A and B).
8. **H. M. Al-Rizzo**, R. Adada, and M. Haidar: Numerical modeling of an octagonal waveguide applicator for high-power microwave heating applications using Ansoft's HFSS.
9. **H. M. Al-Rizzo**, and R. Adada: Simulation of a realistic domestic microwave oven loaded with pizza and potato.
10. **H. M. Al-Rizzo**, and R. Adada: Longitudinally slotted rectangular waveguide.

Refereed Journals Publications

IN PROGRESS

1. **Hussain Al-Rizzo**, Rami Adada, "High-Gain Circularly Polarized Virtual Microstrip Antenna Array for Precise GPS Positioning," *IEEE Transactions. Antennas and Propagation*.
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