

Sharif Iqbal, Sheikh, Ph.D., FIET, SMIEEE

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A dedicated and skilled faculty member with 15+ years of experience in developing and teaching courses in Electrical/Computer/Biomedical Engineering and supervised/examined 100+ undergraduate and graduate projects/thesis. Have extensive experience in industrial contract research work for designing electronic sensors for Schlumberger, KinetixBeam, Honeywell, Arabian-American-Oil-company (ARAMCO), KACST, and Saudi Basic Industries Company (SABIC). Worked as an application engineer at Phillips International Center in BD and IBCO Ltd in UK.

During my academic career, I have introduced/taught courses and labs on Circuit Theory (I and II), Electronics, Signals and Systems, Analogue Circuit Design, Digital Logic, Integrated Electronics, Microprocessors/Microcontrollers, Programming (MATLAB/Python/C/Assembly), Electromagnetics and Optics, Introduction to Radar, Microwave Integrated Circuits, Communications and Power Systems. I have a strong record of updating curricula and lab manuals to keep pace with advances in electrical engineering. Most recently, I introduced a Verilog-based FPGA programming laboratory at East Texas A&M University. My training through the Illinois MVCR series strengthened my ability to integrate e-learning tools and evidence-based instructional strategies into STEM courses. In addition, training from ACUE/ASEE courses, and the IEE mentorship program has further enhanced my teaching and student support practices.

My industrial contracted work resulted in 11+ US patents and 150+ publications in top-rated journals, conference proceedings, and technical reports. The inventions include novel sensors for observing the EMC/EMI of a communication system, meta-material-based radar/CubeSat antenna arrays to micro/millimeter-wave control devices, monitoring petroleum/gas transporting pipelines to early detection of bug-infested palm and UAV-based landmine detection to window-based supercapacitor for energy harvesting.

I am a competent user of academic software (Multisim, LTSpice, MATLAB, Python, TinkerCAD, etc) and industrial design software (Intel-Quartus, LABVIEW, HFSS, COMSOL, ADS, etc). I have more than ten years of experience establishing and managing a printed-circuit-board prototyping laboratory, including etching and milling processes. I have also supervised PCB diagnostics and repair in my role as a PCB engineer. In addition, I have managed research laboratories equipped with oscilloscopes, network, spectrum and amplitude analyzers, signal generators, and various test benches. I have extensive experience with ABET accreditation processes and have consistently received employer evaluations of A+ or Distinguished.

Residency Status: Lawful Permanent Resident of USA.

Education and Credentials:

- **Doctor of Philosophy** in Electrical Engineering, University of Manchester, Manchester, UK. (1996)
- **Master of Science** in Communication Engineering and Digital Electronics, University of Manchester-Institute of Science and Technology (UMIST), Manchester, UK. (1992)
- **Bachelor of Science** (Honors) in Electronics & Communication Engineering. Univ. of San Carlos (1992)
- **Senior member:** The Institute of Electrical and Electronics Engineers (IEEE), USA (since 2005).
- **Fellow:** The Institute of Engineering Technology (IET or IEE), UK (since 2008).
- **Member:** American Society of Engineering Education (ASEE), USA.
Applied Computational Electromagnetic Society (ACES);
The institute of Engineers in Bangladesh (IEB)

Professional Experience:

Teaching experience:

- [East Texas A & M University \(ETAMU\)](#), Commerce, Texas.
Lecturer, Electrical Engineering, Department of Engineering Technology (September, 2025).
- [Wentworth Institute of Technology \(WIT\)](#), Boston, Massachusetts.
Visiting Associate Professor, Electrical Engineering (2021 – 2022).
- [K.F. University of Petroleum & Minerals, KFUPM \(2024 QS ranking of #180\)](#), Dhahran, KSA.
Associate Professor, Department of Electrical Engineering (1998 – 2021, 2023 - current).
- [Southern Methodist University](#) (SMU), Dallas, Texas.
Visiting Scholar, Dept. of Electrical and Computer Engg. (Summer terms 2019, 2020 and 2022)
- [University of Manchester](#), Manchester, UK.
Visiting Research Fellow, Dept of Electrical and Electronic Engg. (Summer terms 2000 and 2003)
- [Arizona State University](#) (ASU), Tempe, Arizona.
Post-Doctoral Research Fellow, Telecommunications Research Center (Summer term of 2001)

Responsibilities:

- Consistently earned distinguished (A+) teaching evaluations and played a key role in ABET accreditation and curriculum enhancement for electrical engineering programs
- Managed Digital systems, Electronics and RF/microwave measurement labs and chaired computer and software utilization Team.
- Served as director of a research lab on Antennas, Metamaterials, and Sensors (AMSL)

- supervised PCB fabrication laboratories. Supervised diagnose/Fault-finding, re-engineer/repair even design of control modules related to engine, transmission, communication systems for all type of vehicles .

Industrial joint research Experience:

- [HitElectro](#), Irvine, TX (2025).
PCB Engineer, Control module Re-engineering Team
- [Schlumberger Dhahran Center for Carbonate Research](#), Dhahran, KSA.
Project Lead (2005-2006).
- [Arabian-American Oil Company \(ARAMCO\)](#), Dhahran 31311, KSA.
Project Lead (2019-2000).
- [Saudi Basic Industries Corporation \(SABIC\)](#), Riyadh 11422, KSA.
Project Lead of five contracted projects (2010-2021)
- [King Abdulaziz City for Science and Technology \(KACST\)](#), Riyadh 11422, KSA.
Project Senior Researcher (2014-2016)
- [IBCO Limited](#), 648 Ashton Old Road, Manchester M11 2WD, UK.
Engineer (1991-1992)
- [Philips](#) International Center, 36/2 Senpara Parbata, Dhaka, BD.
Electronic Engineer, Maintenance Department (1990-1991)

Responsibilities:

- Developed innovative sensors for applications in the petroleum and gas industry.
- Designed, fabricated and tested engineering solutions as per industry requirements.
- Develop RFID and remote sensing solutions.

Areas of Expertise:

- Teaching and designing electrical engineering undergraduate and graduate courses including, Digital and Analog Electronics; RF and Microwave Circuits; Microprocessors and Microcontrollers, programming in Assembly, C, Matlab... ; Wireless Communications, IoT & Smart Sensors, RADAR, Circuit Theory (I and II) and Signal and systems...
- ABET Accreditation & Curriculum Development
- Professional simulators: Multisim, Quratus, MATLAB, LabVIEW, Python, HFSS, COMSOL, LTSPICE etc.
- Prototype fabrication: PCB fabrication, troubleshooting and repair
- Measurements: D10light, Network/Spectrum Analyzer, Oscilloscope, RLC meters etc
- Develop and manage research labs in the field of electrical engineering.

Research Interests:

- Sensing Technologies – Design and implementation of micro/millimeter-wave sensors for industrial monitoring, environmental detection, and biomedical applications.
- Electromagnetics and High-Frequency Engineering – Design, modeling, optimization, and experimental validation of RF, microwave, and millimeter-wave devices.
- Advanced Antenna Systems – Development of high-gain, multi-band, and reconfigurable antennas for space, IoT, CubeSat, and next-generation wireless communication systems.
- Metamaterials and Nanocomposites – Exploration of magnetic-meta materials and nanocomposites for tunable, compact, and high-performance high-frequency electronics.
- Applied Electromagnetics in Emerging Applications – Integration of electromagnetic technologies into wearable biosensors, smart cities, and advanced security scanning systems.

Awards:

- Winner of the Best Antenna Paper Award at the IEE International Conference on Antennas and Propagation, Manchester, UK.
- Two-time recipient of the Outstanding Capstone Project Advisor Award.
- Twice awarded the University Distinction Award for Excellence in Teaching.
- Two-time recipient of the Distinguished Instructional Technology Award.
- Twice honored with the University Excellence in Academic Advising Award.
- Three-time recipient of the Distinguished Performance in Student Activities Award.
- Recognized for Scientific Patent Achievements in 2015, 2018, 2020 (twice), 2022, 2024, and 2025 (three times)
- Multiple University Rector's Cup Sports Awards in badminton, football, and table tennis
- 'Hermann-Gmeiner Foundation Academic Award' for Post-Graduate Education from 1990 to 1995.

Scholastic Activities:

- Consulted for government agencies and industry, which resulted in 6 US patents, 100+ inventions published in journals, conference proceedings, and technical reports.
- Supervised/examined 45+ post-graduate (PhD/MSc) theses and 55+ (BSc) capstone projects.
- Awarded 15 research projects funded by the industry with a total funding of millions of US dollars.
- Established an Engineering and Technology student chapter (IEE/IET) and mentored it for 14+ years.
- Managed PCB prototype fabrication and electrical measurement laboratories for 10+ years.

- Complete courses on 'Digital learning and instructional strategies' to 'Essentials of Effective Instructions' in Universities located in Saudi Arabia, UK and USA.

Scientific Publications ([Google Scholar h-index of 17](#), [Google Scholar page](#)):

US Patents (selected)

- Sep. 2025: "[Ultra high frequency antenna with variable frequency range](#)", #US12412989B1.
- Aug. 2025: "[Satellite antenna with metal foil etched film layer](#)". *US Patent* #US12394910B1.
- May 2025: "[Dual Polarized UHF Band CubeSat Antenna](#), *US Patent* #US12308519B2.
- May 2025: "[Ten Element Single-band MIMO Antenna for 5G Smartphones](#)", #US20250167429A1.
- Jan. 2025: "[Shared Aperture Antenna for Medical Devices](#)", *US Patent* #US20250038416A1.
- Nov. 2025: "[Shared Aperture Folded Dipole Antenna](#)", *US Patent* #US12155135B2.
- Sep. 2022: "[Highly miniaturized folded-slot based MIMO antenna design for CubeSat applications](#)", *US Patent* #US11450968.
- Nov. 2020: "[Low-frequency apparatus and method for insect infestation detection](#)" *US Patent* #US20200348254A1.
- Jan. 2020: "[Metering System for Three-Phase Oil Flow in Horizontal Pipeline](#)", *US Patent* #US10527470.
- May 2018: "[Ferrite Loaded Circular Waveguide Antenna for 3D Scanning](#)", *US Patent* #US9979085B2.
- May 2015: "[Ferrite-Loaded, Fabry-Perot Cavity Antenna](#)", *US Patent* #US9035843.

Journal Publications (selected from past 5 years)

- IEEE ACCESS (2025): "[Fuel Adulteration Detection using Open-Ended Coaxial Line and Circular Waveguide Techniques](#)".
- The Chemical Record Japan (2025): "...[Biomass-derived Carbon Materials: Applications, Innovations, and Future Directions](#)", <https://doi.org/10.1002/tcr.202400144>.
- IEEE Canadian Journal (2024): "[Efficient Design of Super-Directive Antenna Array using Schelkunoff Method and Genetic Algorithm](#)," DOI: [10.36227/techrxiv.171502916.64231060/v1](https://doi.org/10.36227/techrxiv.171502916.64231060/v1).
- IEEE Internet of Things (2024): "[Electronically Switchable Frequency and Pattern Reconfigurable Segmented Patch Antenna for Internet of Vehicles](#)", DOI: [10.1109/JIOT.2024.3362906](https://doi.org/10.1109/JIOT.2024.3362906).
- IEEE ACCESS (2023): "[Advances in Antenna-Based Techniques for Detection and Monitoring of Critical Chronic Diseases: A Comp. Review](#)".
- IEEE ACEESS (2023): "[U-grooved Selectively Coated and Highly Sensitive PCF-SPR Sensor for Broad Range Analyte RI Detection](#)".

- IEEE Antennas and Wireless Propagation Letters AWPL (2023): “[Design of Frequency Reconfigurable Antenna on Dielectric and Magnetic Metamaterial Composite Substrate](#)”.
- Ain Shams Engineering (2022): “[Design of an efficient Thulium-doped fiber amplifier for dual-hop earth to satellite optical wireless links](#)”.
- Crystals (2022): “[Design of a Hollow-Core Photonic Crystal Fiber-Based Edible Oil Sensor](#)”.
- Micromachines (2022): “[Performance Enhancement of Ytterbium-doped Fiber Amplifier Employing a Dual-stage in-band Asymmetrical Pumping](#)”.
- IEEE Sensors Journal (2022): “[Microwave Sensing of Elemental Sulfur Deposition in Gas Pipelines](#)”.
- IEEE ACEESS (2023): “[Dual Sense Circularly Polarized Compact Slot Antenna for CubeSat Applications](#)”
- Journal of Material Research and Technology (2021): “[Alterations in the magnetic and electrodynamic properties of hard-soft Sr_{0.5}Ba_{0.5}Eu_{0.01}Fe₁₂O₁₉/NixCuyZnwFe₂O₄ nanocomposites](#)”.
- IEEE Canadian Journal (2021): “[Non-uniform Scattering of Microwave Radiation due to Layered DUSA Storm: Theory and Experiment](#)”.
- Engineering Reports (2020): “[Multiple-input-multiple-output antenna with pattern reconfigurable and correlation reduction for WLAB application](#)”.
- IEEE Transactions on Instrumentation and Measurement (2019): “[Capacitance-Based Monitoring of a Three-phase Crude-Oil Flow](#)”.
- IEEE ACEESS (2019): “[Novel Solution for Multi-Phase Semi-Cylindrical Capacitive Sensors](#)”.
- IEEE Antennas and Wireless Propagation Letters (2019): “[Directive Wideband Cavity Antenna with Single Layer Meta-Superstrate](#)”.
- Surfaces and Interfaces (2018): “[Microwave radiations effect on electrical and mechanical properties of poly \(vinyl alcohol\) and PVA/graphene nanocomposites](#)”.

Conference Publications (selected from past 5 years))

- IEEE Int. Symposium on Antenna and Propagation (2025): “[Effective Design of a Sixth Order Circular Polarized OAM Mode Ring Patch Antenna](#)”, Ottawa Canada.
- IEEE Int. Symposium on Antenna and Propagation (2025): “[A Novel High gain Ultra-wideband Antenna for W-band Applications](#)”, Ottawa Canada.
- IEEE Wireless and Microwave Circuits and Systems (2025): “[Beam Steerable Standing Wave Antenna](#)”, Baylor, Texas, April 2025.
- Int. Conf. on Renewable Energy Generation and Application (2024): “[AI-Based PV Panels Inspection using an Advanced YOLO Algorithm](#)”, Al-Khobar KSA.
- IEEE Int. Symposium on Antenna and Propagation (2024): “[Design of a Compact Combined OAM Modes Uniform Circular Antenna Array](#)”, Florence Italy.

- IEEE Int. Symposium on Antenna and Propagation (2023): "[Detecting Solid Sulfur Deposition using Dual-Band Antenna](#)", Portland, Oregon.
- IEEE Int. Symposium on Antenna and Propagation (2023): "[Magnetic Metamaterial Frequency Tunable Antenna](#)", Portland, Oregon.
- IEEE Int. Symposium on Antenna and Propagation (2023): "[Transparent MIMO Antenna for Closely Spaced Antenna Elements](#)", Portland, Oregon.
- IEEE Int. Symposium on Antenna and Propagation (2023): "[Multi-Band CubeSat Antenna and Design Considerations for Space Environment](#)", Portland, Oregon.
- IEEE Int. Symposium on Antenna and Propagation (2022), "[Miniaturized Slot MIMO Antenna with Pattern Diversity for CubeSat Applications](#)", Denver, Colorado.
- American Society for Engineering Education Northwest Conference (2022): "[Robust Cellular Connection-Based Smart Street Lighting System for Supporting Strategic IoT Smart City Applications](#)", Boston.
- American Society for Engineering Education Northwest Conference (2022): "[Detection of Red Palm Weevil Infestation in Palm Trees](#)", Boston.
- IEEE Int. Symposium on Antenna and Prop. (2020): "[Enhanced Isolation of MIMO Slot Antenna Array Employing Modified EBG Structure and Rake-shaped Slots](#)", Montreal Canada.
- IEEE Int. Symposium on Antenna and Prop. (2020): "[Multi-Resonance Stacked Patch Antenna for Detection of Elemental Sulfur](#)", Montreal Canada.
- IEEE Int. Symposium on Antenna and Prop. (2020): "[Magnetic Metamaterial based Wideband Frequency Reconfigurable Monopole Antenna](#)", Montreal Canada.
- IEEE Radio & Wireless Symposium (2020): "[Linear and Planar Antenna Array Nulling based on Schelkunoff Polynomial and Genetic Algorithm Monopole Antenna with Beam Scanning in Both End-fire and Broadside Directions](#)", IEEE Radio & Wireless Symposium, San Antonio, January 2020.
- IEEE International Symposium on Antenna and Propagation (2019), "[Microstrip Antenna Array with Reduced Mutual Coupling Using Slotted-Ring EBG Structure for 5G Applications](#)", Atlanta.

Publications on Engineering Education (selected):

- American Society for Engineering Education, Northwest conference (2022), "[Inclusion of PCB Fabrication and Testing within Lab experiments](#)", Boston.
- American Society for Engineering Education, Northwest conference (2022), "[Filling the Gaps Between Courses: A Proposal to Develop a Network Analysis Laboratory Manual](#)", Boston.

Published Technical Reports for Funded Industrial Projects (selected):

- 2023: "[Higher Order OAM Generation for Antenna Maximum Gain Diversity extended to CubeSat Transparent Antennas Analysis](#)", Interactive Research Center for Communication systems & Sensing, KFUPM, KSA.

- 2023: "[Detection of Elemental Sulfur Deposition in Gas Pipeline using Microwave and Optical Techniques](#)", Final report for Saudi ARAMCO, KSA.
- 2023: "[Electromagnetic-based Wearable Biosensor for Non-invasive Blood Glucose Monitoring Systems](#)", Final report for IRC-CS, KFUPM, KSA.
- 2021: "[Design and Implementation of a CubeSat Antenna Design for Space Communication](#)", Final report for DSR, KFUPM, Saudi Arabia.
- 2020: "[EBG/SNG Integrated Antenna System with Improved Mutual Isolation for 5G Wireless Systems](#)", Final report for DSR, KFUPM, KSA.
- 2016: "*Simple Microwave Technique for Monitoring Fluid Level in a Petroleum Carrying Pipeline*", Final report, Saudi Basic Industries Corporation (SABIC), KSA.
- 2015: "[Design of a Directive Ferrite Loaded Waveguide Antenna for Multi-directional Beam Steering](#)", Final reports, Saudi Basic Industries Corp. (SABIC), KSA.
- 2014: "[A Novel Phase Shifter-less Beam Scanning Technique using Engineered Gyrotropic Superstrate](#)", Final Report Saudi Basic Industries Corp. (SABIC), KSA.
- 2014: "Design of Active 24-GHz phased-array ant. for microwave sensors", Final Report, King Abdulaziz City for Science and Technology (KACST), KSA.
- 2013: "Measuring the Water-level in the Oil Transmission Pipes using EM-waves", Final report, Schlumberger Carbonate Research, KSA.

For the remaining publications, please visit my [Google Scholar page](#)

NSF and Internationally funded Projects (selected):

- 2025: Co-authored the proposal "Advancing the Understanding and Use of Artificial Intelligence (AI) Technology in Postsecondary Education" for a U.S. Department of Education grant.
- 2025: Co-authored the proposal "Development of a Compact 28-GHz Transceiver with Integrated Antennas for Smart City Drone Applications", RDIA KSA grants. This internationally collaborative proposal involved Arizona State University (USA), East Texas A&M University (USA), and KFUPM (KSA).
- 2024: Co-investigator of a funded project "Black Powder Detection and Removal from Crude-Oil Transportation Pipelines", RDIA, KSA grants. Duration: 12 months; Start date: December 2024.
- 2023: Co-investigator of a funded project "Piezo Sensors for Real-Time Monitoring of Strength Development During Carbon-Curing of Plastic-Waste Incorporated Concrete (INCS-2402)", Duration: 12 months; Start date: January 2023.
- 2023: Co-investigator of a funded project "Higher-Order OAM Generation for Antenna Maximum Gain Diversity and CubeSat Transparent Antenna Analysis (#INCS-2302)", KFUPM, KSA. Duration: 12 months; Start date: January 2023.

- 2022: Co-investigator of a funded project “Electromagnetic-based Wearable Biosensor for Non-Invasive Blood Glucose Monitoring Systems (#INCS-2202)”, KFUPM, KSA. Duration: 12 months; Start date: January 2022.
- 2021: Co-investigator of a funded project “Detection of Elemental Sulfur Deposition in Gas Pipelines Using Microwave and Optical Techniques (#INCS-2102)”, Duration: 12 months; Start date: August 2021.

Industry-Sponsored Undergraduate Capstone Projects (Selected):

- **Design of Microwave Sensor for Monitoring Sulfur Buildup in the Gas Pipeline:** A reconfigurable microwave antenna (S and X band) is designed to monitor the H₂S depositing in a gas-carrying pipeline. The conformal antenna array is mounted in the inner wall of the pipe (for Saudi Aramco).
- **Design of Novel Magnetic Metamaterial-Based Reconfigurable Antenna for Indoor Wireless Communication Devices and Sensors:** The gyro-magnetic properties of ferrites and meta-material are optically coupled to design the magnetic-meta-material substrate. The planer antenna based on this substrate demonstrated a frequency tuning bandwidth of 650 MHz and beam scanning of 25° for an optimal change in the external biasing field ($\Delta H_0=0.06T$). Integrating the biasing coils using the LTCC technique allows further reduction of ΔH_0 , as required in a 4G and 5G antenna system for MIMO and PCA applications (Center for Comm. And Sensing).
- **Design of Fabry-Perot Antenna for 3D Beam Scanning:** Incorporating phased array technique to scan the main beam of a directive Fabry-Perot cavity (FPC) antenna produces side-lobes proportional to the scan angle. An alternative dielectric-ferrite superstrate-based scan mechanism with a controlled side-lobe level is developed in this design. An externally tunable 3D beam scan of 24° is demonstrated with a reduced side-lobe level of 4.49 dB. (Jointly with the University of Florida).
- **High-Power Beam Scanning Antenna for Base-Station:** High-power waveguide antennas are widely used for military and commercial applications. An analytical technique is used to plot the mode chart and identify the low-loss operating region of the magnetic material-loaded waveguide antenna. The fabricated single waveguide antenna demonstrated a 3D beam scan up to ±30° (for Saudi Telecom).
- **Simple Microwave Sensor for Monitoring the Three-phase Flow:** This project designed a simple integrated patch antenna to monitor the extracted three-phase contents flowing through a petroleum-carrying pipeline. The resonant frequency of the mixture was optimally measured to determine a look-up table, required by a microcontroller-based sensor (for Schlumberger).

Organized Conference/Short-Course/Workshop/Seminars (Selected):

- 2025: Moderated a roundtable discussion on “The Future of Work in the Age of AI” at the Industry Connect Workshop, Paris, Texas.
- 2025: Served as faculty mentor for the IEEE Club field trip to L3 Harris, Greenville, Texas.

- 2025: Delivered an invited talk at an IEEE seminar titled "FPGA Design and Testing Using Verilog, Quartus, and the DE10-Lite Board", East Texas A&M University, Texas.
- 2024: Delivered a invited talk at IET seminar titled "Benefits of joining the IET students club", KFUPM, KSA.
- Delivered a seminar titled "Electromagnetic Sensors to Monitor Petroleum Transportation" at the EM Seminar, Electrical Engineering Department, KFUPM, KSA.
- 2023: Organized a seminar on "Future of RFID Safety in Industries", KFUPM, KSA.
- 2019: Chaired sessions on "Electromagnetic Band Gap Structures" at IEEE APS Conference, Atlanta.
- 2019: Organizing Committee Member for the International Conference on Electronics & Electrical Engineering, Rome, Italy.
- 2017: Organizing Committee Member for the 9th IEEE-GCC Conference, Manama Bahrain.
- 2017: Organizing Committee Member for the International Conference on Petroleum Engineering, Bangladesh 2016.
- 2014: Member of the Organizing Committee for "IEEE Saudi Technical Exchange Meeting", KSA.

Reference:

- **Dr. Ifana Mahbub**, Associate Professor and Texas Instruments Early Career Chair Awardee, Erik Jonsson School of Engineering and Computer Science, University of Texas at Dallas, Richardson, Tx 75080-3021, Tel: (972)-883-6463, Email: Ifana.Mahbub@utdallas.edu
- **Dr. Azmal Khan**, Associate Professor, Department of Electrical and Computer Engineering, Ohio Northern University, Ada, OH 45810, Tel: 419-772-3061, Email: m-khan.2@onu.edu
- **Dr. Ibrahim Khalil**, R&D Director, NXP Semiconductors, Chandler, AZ. Tel: 602 860 5845, Email: ibrahim.khalil@nxp.com
- **Engr. Samiha W. Sharif**, Application Engineer, Texas Instruments (TI), Dallas. Tel: 9146087702. Email: s-sharif@ti.com
- **Prof. Raj Mittra**, Courtesy Professor, Department of Electrical and Computer Engineering, University of Central Florida, Florida 32816-2362, Tel: 814-861-5991, Email: rajmittra@ieee.org or raj.mittra@ucf.edu