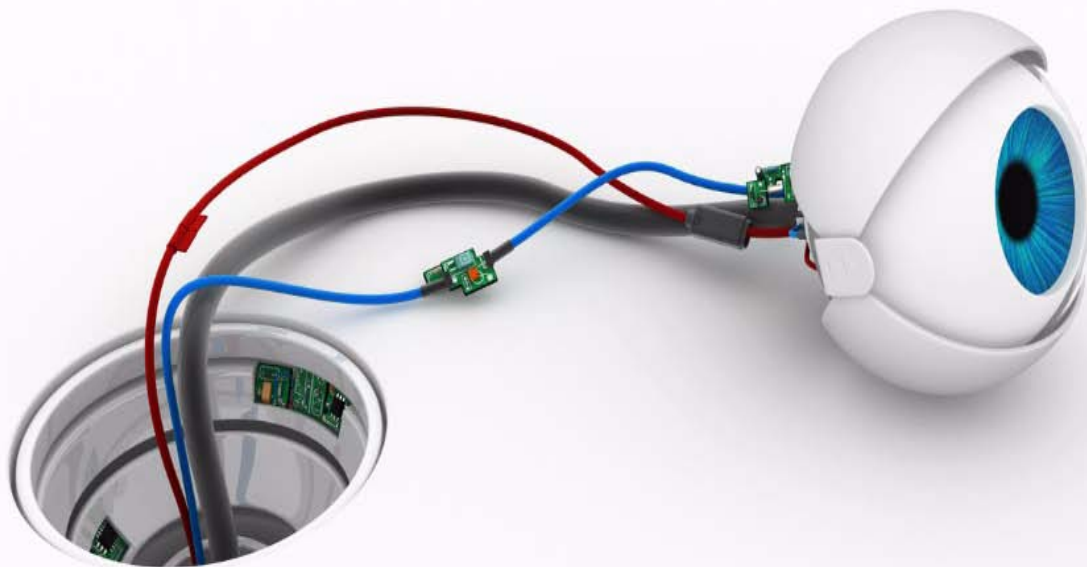# BOSTON

# THE REFLECTOR

# IEEE
## Advancing Technology for Humanity

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# PSSSST……. IEEE is for more than just EE's – pass it on….

Denise Griffin – 2021 IEEE Boston Section Vice Chair

IEEE has provided me with some of the best experiences in my professional career.  On a personal level, I feel it is a place where I am able to learn from various experts in the wide field of technology, meet people of all different ages and backgrounds, from all over the world, and feel like I can ask questions without fear, and take risks with roles that I try.   I have grown my network, interacted with some of the most brilliant people, found a few mentors, been inspired at the accomplishments of fellow members, joyously clapped at Award Ceremonies, and been lucky enough to make a few lifelong friends.

On the "giving back" side, I have been a part of managing countless *impactful* events, both for K-12 and professionals.  I have been able to push for diversity through my roles in IEEE WIE; I have been able to offer my skills running conferences and recruited multiple companies to sponsor IEEE in many ways.  I have encouraged many a student to stay with IEEE upon graduation and keep it as part of their life.

The one thing that bothers me about IEEE?

It's that none of my high school, college friends, or work friends are joining it with me - even the ones who were engineers in college.  Even the ones who see my social media posts about things I do and places I go, or they hear about talks I give at schools and at companies.  So when I ask why they don't just come along and join - the answer, most of the time, is "I wasn't an EE in college" or "I was an EE but haven't done EE work since college".   It is a huge understatement to say that this answer from them literally makes me crazy.

I want to help change this perception.

I was an EE major at Tufts University, so I joined IEEE right away and became an officer soon after.   But my first job out of college, one that I loved, was in Systems Engineering.  Then I found Product Management, then Program Management, and now, Customer Success.  None of those titles fit the exact definition of an EE.  But yet here I am – 30 years after college graduation, entirely committed to IEEE, the members of the Boston section and beyond, because I'm passionate about technology, advancing technology for humanity, making a difference, helping kids consider engineering, bringing more women into the field, and being surrounded by motivated, intelligent people who are as busy as I am but are still willing to volunteer their time to make great things happen.

During the last few years, COVID has of course prevented us from having in-person IEEE meetings.  I have missed my IEEE in person events more than I can explain.  Thanks to technology we are still able to keep having events in some capacity - we adapt - with great tools like Webex and Zoom.  Yet I really and truly cannot wait until we can all be together again so that I can be around these people again, to have those fascinating impromptu conversations, to feel the energy that comes from working hard on a team planning an event and having it be successful, and most of all so that our events can be even more impactful, in person.

I try my very best to encourage my friends to join me at IEEE meetings.  But at the end of the day, they are often stuck on the fact that it's all about "EE".  I have had

success a few times and they have come and heard a speaker or two, but I can never get them to join.  I believe that they are truly missing out!

My request:  I ask that each of you, whenever you have the chance, please take the time to explain to even ONE of your technically minded colleagues, neighbors, or friends, that IEEE isn't just about EE.  Talk about the events you have attended and the roles you have had and programs that you have worked on, and how you have witnessed first hand the way in which IEEE can impact and inspire K-12 students and professionals. Let them know that IEEE reaches all areas of the globe, and that it has programs like Government Fellowships, educational opportunities, opportunities for leadership.

Also explain to them that you can volunteer at IEEE at a local, regional or national level.  No amount of volunteering is too small.  We would love to have them!

One of the things I am most proud of in my career is my involvement in both IEEE and SWE.  My friends think of me as having a "large network" and that I have done so many "interesting things outside of work" and gone on "so many trips".   If that is true, it's largely due to IEEE.   A little birdie named Karen once told me that I would feel this way about IEEE if I REALLY got involved beyond just paying dues and showing up for an occasional meeting.  She was right!

Pass it on!

# Call for STEM Proposals

The IEEE Boston Section is calling for proposals for funding a STEM activity.
We are looking for a group willing to or already working on Pre-U STEM educational activities.

The requirements are as follows:
- The group must be running the project or event in the Boston Section geo area.
- The target age group is  K - 12.

Please submit a one-page proposal with details of your program including overview/summary, logistics, collaborators, estimated number of participants, location, and date of the event as well as a detailed budget.

**Proposals are due by December 1, 2021**

**Proposals will be submitted to ieeebostonsection@gmail.com.**

# IEEE Boston Section Online Courses:
## (Students have 180 day access to all online, self-paced courses)

### Electronic Reliability Tutorial Series
**Full course description and registration at ,
http://ieeeboston.org/electronic-reliability/**

### High Performance Project Management
**Full course description and registration at ,
http://ieeeboston.org/high-performance-project-management-online-course/**

### Introduction to Embedded Linux Part I
**Full course description and registration at ,
http://ieeeboston.org/introduction-to-embedded-linux-part-i-el201-online-course/**

### Embedded Linux Optimization - Tools and Techniques
**Full course description and registration at ,
http://ieeeboston.org/embedded-linux-optimization-tools-techniques-line-course/**

### Embedded Linux Board Support Packages and Device Drivers
**Full course description and registration at ,
http://ieeeboston.org/embedded-linux-bsps-device-drivers-line-course/**

### Software Development for Medical Device Manufacturers
**Full course description and registration at ,
http://ieeeboston.org/software-development-medical-device-manufacturers-line-course/**

### Fundamental Mathematics Concepts Relating to Electromagnetics
**Full course description and registration at ,
http://ieeeboston.org/fundamental-mathematics-concepts-relating-electromagnetics-line-course/**

### Reliability Engineering for the Business World
**Full course description and registration at ,
http://ieeeboston.org/reliability-engineering-business-world-line-course/**

### Design Thinking for Today's Technical Work
**http://ieeeboston.org/design-thinking-technical-work-line-course/**

### Fundamentals of Real-Time Operating Systems
**http://ieeeboston.org/fundamentals-of-real-time-operating-systems-rt201-on-line-course/**

# CALL FOR IEEE BOSTON SECTION AWARDS NOMINATIONS (2021)

## DISTINGUISHED SERVICE AWARD

**Description** - The purpose of the Distinguished Service Award is to honor an IEEE Boston Section member who has made exceptional and distinguished contributions to the Boston IEEE Section. The Distinguished Service Award is to honor an IEEE Boston Section member who has made exceptional and distinguished contributions to the Boston IEEE Section. This award is a wood, engraved plaque with the recipient's' citation.

**Administration** - The Distinguished Service Award will be administered by the Boston Section's Awards Committee. The Awards Committee will submit their recommendations to the Section's Executive Committee for approval.

**Eligibility** - Individuals nominated for this award must be members of the Boston Section and the IEEE. The award is based upon evidence of distinguished service to the Boston Section. Selection criteria include leadership roles and leadership quality, innovative and important services/contributions to the Boston Section

## DISTINGUISHED MEMBER AWARD

**Description** - The purpose of this award is to recognize distinguished long-term service to the Boston Section of the IEEE and significant contributions in an IEEE field of interest. The Distinguished Member Award recognizes outstanding long-term service (10-years or more) to the Boston Section and significant contributions in an IEEE field of interest This award is a wood, engraved plaque with the recipient's' citation

**Administration** - The Distinguished Member Award will be administered by the Boston Section's Awards Committee. The Awards Committee will submit their recommendations to the Section's Executive Committee for approval.

Eligibility - Individuals nominated for this award must have been members of the Boston Section for at least the previous ten (10) years.  Multiple awards may be given each year, if suitable candidates are nominated.  Individuals nominated for this award must currently be members of the Boston Section and members of the IEEE.  The award is based upon evidence of distinction in long-term service to the Boston Section and for contributions to the fields of interest to the IEEE.  Selection criteria include leadership roles and leadership quality, innovative and important contributions to the Boston Section, service and dedication to the Boston Section, and technical achievements in the fields of interest to the IEEE.

## STUDENT ACHIEVEMENT AWARD

**Description** - The purpose of the Student Achievement Award is to recognize a college student who demonstrates the potential to become distinguished leader and outstanding contributor in an IEEE field of interest. This award is a wood, engraved plaque with the recipient's' citation The Student Achievement Award is to recognize a college student who demonstrates the potential to become a distinguished leader and outstanding contributor in an IEEE field of interest.

**Administration** - The Student Achievement Award will be administered by the Boston Section's Awards Committee. The Awards Committee will submit their recommendations to the Section's Executive Committee for approval.

**Eligibility** - An individual nominated for this award must be a student (sophomore year or higher), in good standing, at an institution of higher education located in the Boston Section or be a legal resident within the Boston Section who is attending an institution of higher education outside the Section. The nomination must be submitted by, or endorsed by, the student's major professor, academic advisor or Dean of the department/college they are attending. All nominees' major field of study must be in an IEEE field of interest. The award is based upon evidence of distinguished leadership, accomplishment, and/or outstanding contributions that further the aims of the IEEE.

The deadline for submitting nominations for the 2021 Boston Section Awards is Friday, December 31, 2021.

**Nominations can be submitted to the Boston Section Awards Committee at
ieeebostonsection@gmail.com**

# Consumer Technology Society
# Call for Volunteers!

We are currently looking for volunteers who would be interested in pushing forward the mission of the Consumer Technology (CT-S), Boston Chapter. The chapter is looking for volunteers to help organize chapter meetings and help meet the needs of the local CT-S member needs.

The Boston Section is organizing chapters into groups of similar technical interest areas to pool their resources for easier and better chapter collaboration in planning the chapter events.

**If you have interest in volunteering for a chapter leadership position or are interested in learning more about what these volunteer positions may entail, please send an email to Karen Safina in the IEEE Boston Section office at, ieeebostonsection@gmail.com**

Aakash Deliwala, Chair, IEEE Boston Consumer Technology Chapter

# Engineering in Medicine & Biology Society
# Call for Volunteers!

We are currently looking for volunteers who would be interested in pushing forward the mission of the Engineering in Medicine & Biology Society (EMBS), Boston Chapter. The EMBS - Boston Chapter was recently approved in July 2021, and we're looking to make a significant impact in the area of Biomedicine, Bioengineering, and Biotechnology in the region. The chapter is looking for volunteers to help organize chapter meetings and help meet the needs of the local EMBS members.

The Boston Section is organizing chapters into groups of similar technical interest areas to pool their resources for easier and better chapter collaboration in planning the chapter events.

**If you have interest in volunteering for a chapter leadership position or are interested in learning more about what these volunteer positions may entail, please send an email to Karen Safina in the IEEE Boston Section office at, ieeebostonsection@gmail.com.**

Aseem Singh, Marie Tupaj, Co-Chairs, Boston EMBS Chapter

# IEEE Video Series

A collaborative discussion panel featuring esteemed members from the Institute of Electrical and Electronics Engineers has convened in 2021 to produce educational video presentations that embrace IEEE's mission of advancing technology for humanity.

Among the programs they've produced include "Electric Vehicles: Fun Saving Our Planet", "Greener Power For More Electric Vehicles", "Overcoming Nuclear Fears To Achieve Net Zero CO2 By 2050" and "Achieving a Net Zero Carbon Future", and "Green Energy's Economic Progress". Projects currently in production include the expansive topic of futurology, with a focus on increasing the efficiency and transformation of aging electrical power generating stations and infrastructure to accommodate nuclear power; reviewing the viability of alternative energy (such as geothermal, wind and solar); and focusing on 'cleaner' fossil fuels that are more environmentally-friendly to slow the rate of climate change.

These shows are produced and directed by Lennart E. Long, IEEE Senior Life Member from the Executive Committee and Past Chair of the Boston Section; Dr. Paul H Carr, BS, MS, MIT; PhD Brandeis U, IEEE Life Fellow; Dr. Ted Kochanski, SB (MIT), Ph.D (U.Texas, Austin), IEEE Global Education for Microelectronic Systems and former Boston Section Chair; and Dr. Ken Laker, B.E. (Manhattan College), M.S. and Ph.D. (New York University), IEEE Life Fellow and past President of IEEE.

The panel is moderated by five-time Boston/New England Emmy Award-winner and television personality and star of "The Folklorist," John Horrigan.

These video programs with presentations and discussions can be accessed at the IEEE Boston Section video portal at https://vimeo.com/user18608275.

We are looking for any IEEE members that would like to appear on the program in the role of presenter or discussion expert. Simply reach out to Robert Alongi at the Boston Section at, ieeebostonsection@gmail.com.

# Call for Course Speakers/Organizers

IEEE's core purpose is to foster technological innovation and excellence for the benefit of humanity. The IEEE Boston Section, its dedicated volunteers, and over 8,500 members are committed to fulfilling this core purpose to the local technology community through chapter meetings, conferences, continuing education short courses, and professional and educational activities.

Twice each year a committee of local IEEE volunteers meet to consider course topics for its continuing education program. This committee is comprised of practicing engineers in various technical disciplines. In an effort to expand these course topics for our members and the local technical community at large, the committee is publicizing this CALL FOR COURSE SPEAKERS AND ORGANIZERS.

The Boston Section is one of the largest and most technically divers sections of the IEEE. We have over 20 active chapters and affinity groups.
If you have an expertise that you feel might be of interest to our members, please submit that to our online course proposal form on the section's website (www.ieeeboston.org) and click on the course proposal link (direct course proposal form link is **http://ieeeboston.org/course-proposals/** . Alternatively, you may contact the IEEE Boston Section office at ieeebostonsection@gmail.com or 781 245 5405.

- **Honoraria can be considered for course lecturers**
- Applications oriented, practical focused courses are best (all courses should help attendees expand their knowledge based and help them do their job better after completing a course
- Courses should be no more than 2 full days, or 18 hours for a multi-evening course
- Your course will be publicized to over 10,000 local engineers
- You will be providing a valuable service to your profession
- Previous lecturers include: Dr. Eli Brookner, Dr. Steven Best, Colin Brench, to name a few.

*Entrepreneurs' Network – 7:00PM, Tuesday, November 2*

# Design, Plant, and Utility Patents: Protecting your Startup's Intellectual Property

Location:  WEBINAR

**Registration: https://boston-enet.org/event-4411622**
**ENET Member:  Free**
**General Public:  $10.00**

The US Patent and Trademark Office issues at least three kinds of patents. Utility patents are generally well known. They protect novel products, systems, techniques, and processes. Two other kinds of patents issued by the USPTO may be relevant to startups. Design patents protect the ornamental aspects of things and can be hugely important as illustrated by the Apple v Samsung infringement litigation over certain aspects of phones and tablets. Plant patents are perhaps becoming more important. For example, 50 plant patents have been issued by the US Patent Office protecting many varieties of cannabis and hemp. Startups should also consider trademarks as an extension of their patent strategies. Now seems like a great time to review the kinds of patents and why patents and other forms of intellectual property matter.

Questions that our panel of experts will address include:
What are utility, provisional, design and plant patents?
What protections do each of these patents offer to a company, its investors, and shareholders?
What are the tradeoffs between investing in IP, product development, and getting to market?
What are the technology and market differences in the timing of investing in IP?
When do investors care about IP?
When and where should companies consider protecting IP in foreign countries?

This meeting's presentations and discussion will cover the importance of IP to various people and aspects of startup companies, including, founders, investors, inventors, engineering, product development, and marketing. A question and answer session will follow the panel discussion, and panelists will be available afterward for responses to individual questions.

**Agenda:**
7:00 – 7:10 PM – ENET Chairperson's announcements
7:10 – 7:25 PM – eMinute Pitch - Up to 3 Startup companies' presentations
7:25 – 8:10 PM – expert speakers on the night's topic
8:10 – 8:30 PM – Moderator and Audience Q & A with the speakers
8:30 – 9:00 PM – Networking on Zoom (meet with speakers & moderator)
(All times are USA Eastern Daylight time; webinars will not be recorded)

**Speakers:**

David Burns, Partner at McCarter & English LLP

David Burns is a Partner at McCarter & English LLP's Boston, MA office. For over 12 years David was an Electrical Engineer at Raytheon Company. While there, he worked in the areas of signal processing, radar system integration, and the development, design, and manufacture of the principal phased array antenna for the IRIDIUM constellation of communication satellites. David has almost 20 years' experience in patent prosecution, trademark registration, due diligence, patentability, validity, infringement, and non-infringement matters for U.S. and international clients, which include startups, emerging growth companies, and Fortune 500 companies. His practice focuses on the strategic development, protection and management of patent portfolios. David manages and has managed many patent portfolios with some having over 400 issued U.S. and international patents. Lately, his practice has focused on securing patents related to cutting edge technologies involving AI, machine learning, cybersecurity, block chain, AR, and VR. Additionally, David works in the areas of medical device technology, including syringes, on body delivery systems, automatic injection devices, optical coherence tomography devices, and imaging devices. Also, David works in areas related to optical electronics, microprocessor architecture and circuitry, electromagnetics, engine control systems, biometrics, telecommunication architectures and devices, solar cells, analog devices, and semiconductor fabrication. David Burns on LinkedIn
https://www.linkedin.com/in/david-burns-ab55065/

J. Peter Fasse, Principal at Fish & Richardson P.C.
Peter Fasse is a Principal in the Boston office of Fish & Richardson (Fish), and has been working at Fish since 1987. Peter has two B.S. degrees from MIT, in Life Sci-

ences and Bioelectrical Engineering. His practice emphasizes client counseling, opinion work, and patent prosecution in a wide variety of technologies, with an emphasis on healthcare, Life Sciences, medical devices, and other biomedical fields plus various green technologies. Peter helps clients from start-ups to multinationals to develop competitive worldwide patent strategies and to establish solid and defensible patent portfolios. He performs competitive patent analyses, IP due diligence to support company acquisitions, identifies third-party patent risks, and provides patentability and freedom-to-operate opinions. Peter also has experience in opposing and defending patents in U.S. litigation and post-grant proceedings and before the European Patent Office. Peter has experience in various fields including medical therapeutics, diagnostics, devices, imaging, microfluidic systems, nucleic acid sequence analysis systems and software, molecular biology, complex biomedical systems, optics, machine tools, RNAi and CRISPR therapeutics, dendritic cell- and DNA-based vaccines, liquid biopsy, engineered AAV systems, next generation sequence analysis, nanoparticle and vector-based delivery, cell culturing and bioprocessing, optics, and lasers. J. Peter Fasse on LinkedIn https://www.linkedin.com/in/peter-fasse-2207911/

William E. Hilton, Partner at Gesmer Updegrove, LLP
Bill is a scientist at heart who concentrates on logical legal analyses.  With Bill's B.S. in electrical engineering and B.A. in computer science, Bill can speak the language of any technology entrepreneur as well as provide sharp legal advice.  Bill's clients appreciate his deep understanding of the scientific, technological and legal principles underlying their inventions, which provides them with invaluable assistance in their efforts to leverage and protect their intellectual property. Bill concentrates his practice in prosecuting electronic, electro-optic, and computer-related patent applications, along with technology licensing and trademark and copyright protection.  He also provides litigation-oriented services to enforce and protect the intellectual property rights of his clients and resolve their disputes. Bill Hilton on LinkedIN C:\Users\weber\Desktop\My Documents\ENET\11-2-2021 Enet Meeting\linkedin.com\in\william-hilton-94b683a

Moderator:

Bob Weber is an intellectual property professional, inventor, serial entrepreneur, senior executive, and management consultant. Presently, he is Managing Director, Patent Kinetics, LLC, a company that helps entrepreneurs and patent owners build and monetize valuable patent portfolios. Weber is an inventor with 27 issued US patents and a number of foreign counterparts assigned to Intertrust Technologies where he served as SVP Business and Technology Strategy, 1996-1999. The Intertrust portfolio was characterized in the Wall Street Journal as a "once in a generation billion-dollar licensing opportunity."  Weber has also been a Principal Consultant at Northeast Consulting Resources, Inc.  At NCRI, his consulting practice focused on strategies for information creation, access and distribution; clients included Fortune 50 companies.  Weber divides his time between Silicon Valley and Boston.  He served on the Advisory Board of the IEEE Boston Entrepreneurs Network ("ENET") at various times between 2004 until June, 2019.  Weber has been a member of the Silicon Valley Chapter of the Licensing Executives Society since 2010 and presently serves on the chapter's Board of Directors and Program Committee. Bob Weber on LinkedIn http://linkedin.com/in/bobweberbos

Co-organizers:

William R. Byrnes, Esq.
Bill is an attorney and senior executive with 25+ years of experience building value by commercializing information and technology. Bill's focus involves a unique application of his legal and business management experience on the day-to-day management of all elements of the product, sales, and contract life cycles as the core of the business. The effect of this focus can convert expense into value driven to the bottom line with increased shareholder value as the results.

Attorney Mansfield is a patent attorney and is a lawyer in MA & NY; high bar exam scores allowed him to waive into the D.C. Circuit.  He won the CALI Award for perfect grades in an IP course, and he has passed the Fundamentals of Engineering Exam covering all types of engineering.  He assists clients with corporate and intellectual property law using trademarks, trade dress, copyrights, licensing, patents, trade secret protection, strategic partnerships, and succession planning. From 2004, he has worked on legal matters & he has counseled entrepreneurs/startups since 2009 thru Mansfield Law.  He has worked on patent prosecution, especially business method, business process, electrical, mechanical, telecommunications, and e-commerce patents. He has filed for global IP protection and has a network of foreign IP professionals.
William Mansfield, Esq. on LinkedIn C:\Users\weber\Desktop\My Documents\ENET\11-2-2021 Enet Meeting\linkedin.com\in\protectyourpassion

*Electromagnetic Compatibility Society – 4:00PM, Wednesday, November 3*

# Electromagnetic Shielding: Concepts and Applications

Speaker: Dr. Sergiu Radu, Oracle

Every electronic equipment use some type of shielding, and from a theoretical point of view, electromagnetic shielding is among the difficult areas of EMC. The presentation is introducing basic shielding concepts, insisting on their practical limitations, and presents the typical engineering problems associated with shielding. Among the aspects discussed are the materials used for shielding, chassis resonances, shielding integrity problems (seams, joints, apertures, perf patterns, etc.), aperture coupling and shield's grounding.

**Outline:**
1. Introduction: Electric, Magnetic and Electromagnetic shielding
2. Analytical approaches to shielding: field theory (Kaden) and circuit theory (Schelkunoff)
3. Limits of the theoretical approaches: numerical simulations
4. Practical aspects of shielding, typical requirements, grounding scheme
5. Shield material: metal, plastic, typical coatings
6. Shield construction: rivets, joints, seams, apertures
7. Shielding and thermal issues: holes, perf patterns, honeycomb
8. Shield integrity and gaskets
9. Internal compartmentalization of a chassis, resonances
10. Practical aspects of source - aperture coupling
11. Shielding for radiated emissions, radiated immunity and ESD - reciprocity aspects and limits
12. Evaluation of shielding effectiveness

Sergiu Radu (M'93, SM'02) received the M.S. and Ph.D. degrees in electrical engineering (Electronics) from the Technical University of Iasi, Iasi, Romania in 1980 and 1995, respectively. He was an Associate Professor at the Technical University of Iasi until 1996, involved in Electromagnetic Compatibility teaching and research. From 1996 to 1998, he was a Visiting Scholar at the University of Missouri at Rolla, currently Missouri University of Science and Technology, as part of the Electromagnetic Compatibility Laboratory.

In 1998, he joined the Electromagnetic Compatibility Engineering group at Sun Microsystems, which became a part of Oracle Corp. in 2010. He is currently Director of Hardware Development at Oracle leading the EMC Design group in Santa Clara, CA., involved in chassis level, PCB level and chip level EMC design for all Oracle hardware products. His role includes also the development and implementation of platform level EMC Design architecture, design methodologies, and better EMC prediction techniques. He holds seven US patents for EMI reduction techniques in electronic systems and has published more than 50 technical papers, presentations and reports on electromagnetic compatibility related subjects.

He is NARTE Certified EMC Engineer since February 1998, a former IEEE EMC Distinguished Lecturer (2009-2010), and a reviewer for IEEE Transactions on EMC. ORCID (Open Researcher and Contributor ID): https://orcid.org/0000-0002-1733-1151

**Meeting Details:**
Topic: IEEE EMC Chapter meeting -
Time: November 3, 2021 04:00 PM Eastern Time

Join Zoom Meeting
https://us02web.zoom.us/j/82837456920?pwd=WX-hJWktxZHdnQTRZWHI1TitiVVFDdz09

Meeting ID: 828 3745 6920
Passcode: 134687
One tap mobile
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Dial by your location
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        +1 646 558 8656 US (New York)
        +1 253 215 8782 US (Tacoma)
        +1 346 248 7799 US (Houston)
        +1 669 900 9128 US (San Jose)
Meeting ID: 828 3745 6920
Passcode: 134687
Find your local number: https://us02web.zoom.us/u/kejR4HCGIY

*Antennas and Propagation Society – 9:00AM, Wednesday, November 3*

# From Engineering Electromagnetics to Electromagnetics Engineering: Teaching/Training Next Generations

Speaker: Prof. Dr. Levent Sevgi - IEEE APS Distinguished Lecturer – IEEE Fellow

Location: Wentworth Institute of Technology – Beatty Hall 426

***Registration:*** *https://ieeeboston.org/event/from-engineering-electromagnetics-to-electromagnetics-engineering-teaching-training-next-generations-2/?instance_id=3171*

The role of Electromagnetic (EM) fields in our lives has been increasing. Communication, remote sensing, integrated command/ control/surveillance systems, intelligent transportation systems, medicine, environment, education, marketing, defense are only a few areas where EM fields have critical importance. We have witnessed the transformation from Engineering Electromagnetics to Electromagnetic Engineering for the last few decades after being surrounded by EM waves everywhere. Among many others, EM engineering deals with broad range of problems from antenna design to EM scattering, indoor–outdoor radiowave propagation to wireless communication, radar systems to integrated surveillance, subsurface imaging to novel materials, EM compatibility to nano-systems, electroacoustic devices to electro-optical systems, etc. The range of the devices we use in our daily life has extended from DC up to Terahertz frequencies. We have had both large-scale (kilometers-wide) and small-scale (nanometers) EM systems. Large portion of these systems are broadband and digital, and have to operate in close proximity that results in severe EM interference problems. Engineers have to take EM issues into account from the earliest possible design stages. This necessitates establishing an intelligent balance between strong mathematical background (theory), engineering experience (practice), and modeling and numerical computations (simulation).

This keynote lecture aims at a broad-brush look at certain teaching / training challenges that confront wave-oriented EM engineering in the 21st century, in a complex computer and technology-driven world with rapidly shifting societal and technical priorities.

The lecture also discusses modeling and simulation strategies pertaining to complex EM problems and supplies several user-friendly virtual tools, most of which have been presented in the IEEE AP Magazine and which are very effective in teaching and training in lectures such as EM Wave Theory, Antennas and Radiowave Propagation, EM Scattering and Diffraction, Guided Wave Theory, Microstrip Circuit Design, Radar Cross Section Prediction, Transmission Lines, Metamaterials, etc.

References
[1]     L. Sevgi, Electromagnetic Modeling and Simulation, IEEE Press – John Wiley (EM Wave Series), NJ, Apr 2014.
[2]     L. Sevgi, Complex Electromagnetic Problems and Numerical Simulation Approaches, IEEE Press – John Wiley & Sons, May 2003.
[3]     L. Sevgi, A Practical Guide to EMC Engineering, ARTECH House, Norwood, MA, March 2017.
[4]     G. Apaydın, L. Sevgi, Radiowave Propagation and Parabolic Equation Modeling, IEEE Press – John Wiley, NJ, Sep 2017.
[5]     G. Apaydın, L. Sevgi, Electromagnetic Diffraction modeling and simulation with MATLAB, ARTECH House, Norwood, MA, Feb 2021.

Prof. Dr. Levent Sevgi is a Fellow of the IEEE. He received his B. Eng., M. Eng., and PhD degrees in Electronic Engineering from Istanbul Technical University (ITU) in 1982, 1984 and 1990, respectively. In 1987, while working on his PhD, he was awarded a fellowship that allowed him to work with Prof. L. B. Felsen at Weber Research Institute / New York Polytechnic University York for two years. His work at the Polytechnic concerned the propagation phenomena in non-homogeneous open and closed waveguides.

He was with Istanbul Technical University (1991–1998), TUBITAK-MRC, Information Technologies Research Institute (1999–2000), Weber Research Institute / NY Polytechnic University (1988–1990), Scientific Research Group of Raytheon Systems Canada (1998 – 1999), Center for Defense Studies, ITUV-SAM (1993 –1998 and 2000–2002) and with University of Massachusetts, Lowell (UML) MA/USA as a full-time faculty (2012 – 2013) and with DOGUS University (2001-2014).

Since Sep 2014, he has been with Istanbul OKAN University.

He has been an IEEE AP-S Distinguished Lecturer for the term 2020-2022. He served one-term in the IEEE AP-S AdCom (2013-2015) and one-term and as a member of IEEE AP-S Field Award Committee (2018-2019). He has been the writer/editor of the "Testing ourselves" Column in the IEEE AP Magazine (since Feb 2007), a member of the IEEE AP-S Education Committee (since 2006), He has also served in several editorial boards (EB) of other prestigious journals / magazines, such as the IEEE AP Magazine (since 2007), Wiley's International Journal of RFMiCAE (2002-2018), and the IEEE Access (2017-2019 and 2020 - 2022). He is the founding chair of the EMC TURKIYE International Conferences (www.emcturkiye.org).

He has been involved with complex electromagnetic problems and complex communication and radar systems for nearly three decades. His research study has focused on propagation in complex environments; electromagnetic scattering and diffraction; RCS prediction and reduction; EMC/EMI modelling, simulation, tests and measurements; multi-sensor integrated wide area surveillance systems; surface wave HF radars; analytical and numerical methods in electromagnetics; FDTD, TLM, FEM, SSPE, and MoM techniques and their applications; bio-electromagnetics. He is also interested in novel approaches in engineering education, teaching electromagnetics via virtual tools. He also teaches popular science lectures such as Science, Technology and Society.

He has given dozens of seminars, invited/keynote talks, organized/presented several tutorials, training sessions and short courses from half-day to three-days in universities/institutes all around the World. He has published more than a dozen special issues / sections in many journals as a guest editor and/or a co-guest editor.

His recent keynote talks are: (i) From Engineering Electromagnetics towards Electromagnetic Engineering: Teaching, Training Next Generations in MMS'2018 Mediterranean Microwave Symposium, Istanbul / Turkey, and in EuCAP 2019 European Conference on Antennas and Propagation, Krakow / Poland, (ii) Radiowave Propagation Modeling and Simulation in APCAP 2019 Asia-Pasific Conference on Antennas and Propagation, Incheon / S. Korea, and (iii) From Design to Market: EMC Engineering in InCAP 2018 Indian Conference on Antennas and Propagation, Hyderabad / India.

He has published many books/book chapters in English and Turkish, over 180 journal/magazine papers/tutorials and attended nearly 100 international conferences/symposiums. His three books Complex Electromagnetic Problems and Numerical Simulation Approaches, Electromagnetic Modeling and Simulation and Radiowave Propagation and Parabolic Equation Modeling were published by the IEEE Press - WILEY in 2003, 2014, and 2017, respectively. His fourth and fifth books, A Practical Guide to EMC Engineering (Sep 2017) and Diffraction Modeling and Simulation with MATLAB (Feb 2021) were published by ARTECH HOUSE.

His h-index is 35, with a record of more than 4100 citations (source: Google Scholar, July 2021).

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*Microwave Theory and Techniques Society (Boston and Orlando Chapters), and Antennas & Propagation Society – 4:00PM, Thursday, November 4*

# Silicon-Based Millimeter-Wave Phased Arrays for 5G: Fundamentals to Future Trends

Speaker:  Dr. Bodhisatwa Sadhu, IEEE MTT-S Distinguished Microwave Lecturer

5G cellular communications use millimeter-wave phased arrays to achieve high data rates and low latency. The majority of the 5G millimeter-wave infrastructure will be partially or completely based on silicon technology. This talk will discuss key aspects of silicon-based millimeter-wave phased-array module design and characterization. It will cover fundamentals of phased arrays, provide an overview of phased array antenna modules using silicon technology, and take a deep dive into an example 5G phased array antenna module. The talk will end with a peek into the future of 5G directional communications.

Bodhisatwa Sadhu received the B.E. degree in Electrical and Electronics Engineering from BITS-Pilani, India in 2007, and the Ph.D. degree in Electrical Engineering from the University of Minnesota, Minneapolis, in 2012. He is currently a Research Staff Member with the RF/mm-wave Communication Circuits & Systems Group at IBM T. J. Watson Research Center, Yorktown Heights, NY, USA, and an Adjunct Assistant Professor at Columbia University, NY. At IBM, he has led the design and demonstration of the world's first reported silicon-based 5G phased array IC, a low power 60GHz CMOS transceiver IC for 802.11ad communications, and a software-defined phased array radio. He has authored and co-authored 50+ peer-reviewed papers, the book Cognitive Radio Receiver Front-Ends-RF/Analog Circuit Techniques (Springer, 2014), and several book chapters. He also holds 60+ issued U.S. patents. Dr. Sadhu currently serves as an IEEE MTT-S Distinguished Microwave Lecturer, the RFIC Systems & Applications sub-committee Chair and a Steering Committee Member of the IEEE RFIC Symposium, TPC member of the Wireless Subcommittee at IEEE ISSCC, and has served as Guest Editor of IEEE TMTT in 2021 and IEEE JSSC in 2017.

Dr. Sadhu is the recipient of the 2017 ISSCC Lewis Winner Award for Outstanding Paper (best paper award), the 2017 JSSC Best Paper Award, the 2017 Pat Goldberg Memorial Award for the best paper in computer science, electrical engineering, and mathematics published by IBM Research, four IBM Outstanding Technical Achievement Awards, twelve IBM Patent Plateau Awards, the University of Minnesota Graduate School Fellowship in 2007,

3M Science and Technology Fellowship in 2009, the University of Minnesota Doctoral Dissertation Fellowship in 2011, the BITS Pilani Silver Medal in 2007, and stood 2nd in India in the Indian School Certificate (ISC) examination in 2003. He was recognized as an IBM Master Inventor in 2017, and was selected by the National Academy of Engineering for its Frontiers of Engineering Symposium in 2020.

**Registration:  https://events.vtools.ieee.org/m/283808**
Join Zoom Meeting
https://ucf.zoom.us/j/95071626753
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        +1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
        +1 669 900 6833 US (San Jose)
Meeting ID: 950 7162 6753
Find your local number: https://ucf.zoom.us/u/aed-HEp36QD
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Join by H.323
162.255.37.11 (US West), 162.255.36.11 (US East)
115.114.131.7 (India Mumbai)
115.114.115.7 (India Hyderabad)
213.19.144.110 (Amsterdam Netherlands)
213.244.140.110 (Germany)
103.122.166.55 (Australia Sydney)
103.122.167.55 (Australia Melbourne)
149.137.40.110 (Singapore)
64.211.144.160 (Brazil)
149.137.68.253 (Mexico)
69.174.57.160 (Canada Toronto)
65.39.152.160 (Canada Vancouver)
207.226.132.110 (Japan Tokyo)
149.137.24.110 (Japan Osaka)
Meeting ID: 950 7162 6753
Join by Skype for Business
https://ucf.zoom.us/skype/95071626753

*Antennas and Propagation Society – 2:00PM, Tuesday, November 9*

# From Engineering Electromagnetics to Electromagnetics Engineering: Teaching/Training Next Generations

Speaker:  Prof. Dr. Levent Sevgi - IEEE APS Distinguished Lecturer – IEEE Fellow

Location:  Massachusetts Institute of Technology – Grier A, Building 34-401, Cambridge, MA

***Registration: https://ieeeboston.org/event/ from-engineering-electromagnetics-to-electromag- netics-engineering-teaching-training-next-genera- tions/?instance_id=3170***

The role of Electromagnetic (EM) fields in our lives has been increasing. Communication, remote sensing, integrated command/ control/surveillance systems, intelligent transportation systems, medicine, environment, education, marketing, defense are only a few areas where EM fields have critical importance. We have witnessed the transformation from Engineering Electromagnetics to Electromagnetic Engineering for the last few decades after being surrounded by EM waves everywhere. Among many others, EM engineering deals with broad range of problems from antenna design to EM scattering, indoor–outdoor radiowave propagation to wireless communication, radar systems to integrated surveillance, subsurface imaging to novel materials, EM compatibility to nano-systems, electroacoustic devices to electro-optical systems, etc. The range of the devices we use in our daily life has extended from DC up to Terahertz frequencies. We have had both large-scale (kilometers-wide) and small-scale (nanometers) EM systems. Large portion of these systems are broadband and digital, and have to operate in close proximity that results in severe EM interference problems. Engineers have to take EM issues into account from the earliest possible design stages. This necessitates establishing an intelligent balance between strong mathematical background (theory), engineering experience (practice), and modeling and numerical computations (simulation).

This keynote lecture aims at a broad-brush look at certain teaching / training challenges that confront wave-oriented EM engineering in the 21st century, in a complex computer and technology-driven world with rapidly shifting societal and technical priorities.

The lecture also discusses modeling and simulation strategies pertaining to complex EM problems and supplies several user-friendly virtual tools, most of which

have been presented in the IEEE AP Magazine and which are very effective in teaching and training in lectures such as EM Wave Theory, Antennas and Radiowave Propagation, EM Scattering and Diffraction, Guided Wave Theory, Microstrip Circuit Design, Radar Cross Section Prediction, Transmission Lines, Metamaterials, etc.

References
[1]     L. Sevgi, Electromagnetic Modeling and Simulation, IEEE Press – John Wiley (EM Wave Series), NJ, Apr 2014.
[2]     L. Sevgi, Complex Electromagnetic Problems and Numerical Simulation Approaches, IEEE Press – John Wiley & Sons, May 2003.
[3]     L. Sevgi, A Practical Guide to EMC Engineering, ARTECH House, Norwood, MA, March 2017.
[4]     G. Apaydın, L. Sevgi, Radiowave Propagation and Parabolic Equation Modeling, IEEE Press – John Wiley, NJ, Sep 2017.
[5]     G. Apaydın, L. Sevgi, Electromagnetic Diffraction modeling and simulation with MATLAB, ARTECH House, Norwood, MA, Feb 2021.

Prof. Dr. Levent Sevgi is a Fellow of the IEEE. He received his B. Eng., M. Eng., and PhD degrees in Electronic Engineering from Istanbul Technical University (ITU) in 1982, 1984 and 1990, respectively. In 1987, while working on his PhD, he was awarded a fellowship that allowed him to work with Prof. L. B. Felsen at Weber Research Institute / New York Polytechnic University York for two years. His work at the Polytechnic concerned the propagation phenomena in non-homogeneous open and closed waveguides.

He was with Istanbul Technical University (1991–1998), TUBITAK-MRC, Information Technologies Research Institute (1999–2000), Weber Research Institute / NY Polytechnic University (1988–1990), Scientific Research Group of Raytheon Systems Canada (1998 – 1999), Center for Defense Studies, ITUV-SAM (1993 –1998 and 2000–2002) and with University of Massachusetts, Lowell (UML) MA/USA as a full-time faculty

(2012 – 2013) and with DOGUS University (2001-2014). Since Sep 2014, he has been with Istanbul OKAN University.

He has been an IEEE AP-S Distinguished Lecturer for the term 2020-2022. He served one-term in the IEEE AP-S AdCom (2013-2015) and one-term and as a member of IEEE AP-S Field Award Committee (2018-2019). He has been the writer/editor of the "Testing ourselves" Column in the IEEE AP Magazine (since Feb 2007), a member of the IEEE AP-S Education Committee (since 2006), He has also served in several editorial boards (EB) of other prestigious journals / magazines, such as the IEEE AP Magazine (since 2007), Wiley's International Journal of RFMiCAE (2002-2018), and the IEEE Access (2017-2019 and 2020 - 2022). He is the founding chair of the EMC TURKIYE International Conferences (www.emcturkiye.org).

He has been involved with complex electromagnetic problems and complex communication and radar systems for nearly three decades. His research study has focused on propagation in complex environments; electromagnetic scattering and diffraction; RCS prediction and reduction; EMC/EMI modelling, simulation, tests and measurements; multi-sensor integrated wide area surveillance systems; surface wave HF radars; analytical and numerical methods in electromagnetics; FDTD, TLM, FEM, SSPE, and MoM techniques and their applications; bio-electromagnetics. He is also interested in novel approaches in engineering education, teaching electromagnetics via virtual tools. He also teaches popular science lectures such as Science, Technology and Society.

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His h-index is 35, with a record of more than 4100 citations (source: Google Scholar, July 2021).

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*Entrepreneurs' Network – 7:00PM, Tuesday, November 16*

# Teamwork Is Critical for Startups: It's Not Just for Sports

ENET is pleased to present this event as an online webinar! Use the link below to pre-register!

***Register Here: https://bostonenet.org/events/teamwork-is-critical-for-startups-its-not-just-for-sports/***

(Please note capacity is limited so pre-registration is necessary)

There are similarities between sports and business. The goal is to win and both require a strong team. It all starts with the team you build, how you motivate them, inspire them to do more, and you retain them. In this event you'll hear from three experts with extensive knowledge helping start-up succeed, building teams, creating strategies and culture.

There will be more than an hour of online networking via Zoom, available to registrants before the meeting, and a half hour networking post-meeting, that would give attendees the chance to "meet" virtually the speakers and moderator.

Agenda:
7:00 - 7:10 PM - ENET Chairperson's announcements
7:10 - 7:25 PM – eMinute Pitch - Up to 3 Startup companies' presentations
7:25 - 8:10 PM - expert speakers on the night's topic
8:10 - 8:30 PM – Moderator and Audience Q & A with the speakers
8:30 – 9:00 PM - Networking on Zoom
(all times are USA Eastern Daylight time)

A question and answer session will follow the panel discussion, and panelists will be available afterward for responses to individual questions.
Register Here: https://bostonenet.org/events/teamwork-is-critical-for-startups-its-not-just-for-sports/

Speakers:
Maureen Metcalf - CEO/Board Chair, Innovation Leadership Institute

Maureen is the CEO of the Innovative Leadership Institute (formerly Metcalf & Associates). An award-winning Senior Business Leader, Chair and Board Member with a proven history of success in leveraging business trends to drive organizational transformation. With over 30 years of industry insight, Maureen has garnered a reputation as a credible change agent with a passion for innovation and an ability to align key strategies with corporate objectives. Both an adept communicator and trusted advisor, she has built and mobilized empowered workforces, supported Executives by developing leadership capabilities and restructured boards to improve business performance. A steady hand in the board room, Maureen has set strategic direction, embedded positive working cultures and ensured robust governance frameworks to increase profitability and improve overall efficiencies.

In addition to working as an executive advisor, Maureen designs and teaches MBA classes in Leadership and Organizational Transformation. She is also the host of an international radio show focusing on innovative leadership, and the author of an award-winning book series on Innovative Leadership, including the Innovative Leaders Guide to Transforming Organizations, winner of a 2014 International Book Award.

Before founding Metcalf & Associates, she worked for PricewaterhouseCoopers and Accenture across a broad range of industries, building strong business acumen and consulting skills.
https://www.linkedin.com/in/maureenmetcalf/

Darcy Eikenberg, PCC - Executive & Leadsrship Career Coach | "Red Cape Rescue: Save Your Career Without Leaving Your Job"

Innovative yet practical, creative yet structured, fun yet results-focused, I strive to be known and

remembered for one key result -- helping leaders get more life out of work.

With a unique mix of perspectives, passions and practice as an ICF credentialed coach, professional speaker, blogger and author, I founded the Red Cape Revolution (RedCapeRevolution.com) as a way to inspire all of us to rediscover our own superpowers, bring them to our work, and make a bigger difference in their corner of the world.

My latest book is "Red Cape Rescue: Save Your Career Without Leaving Your Job." If it's time to take control of your life at work and thrive once again, you'll want to check it out now at RedCapeRescue.com.

I also teach and facilitate leaders' groups inside organizations, focusing on learning how to advocate for their own careers, gain clarity on their future paths, and communicate better with teams and colleagues.

I'd love to help you and your colleagues create new ways to improve your experiences at work in ways that work in our real lives, inside our real organizations, in real time.
https://www.linkedin.com/in/darcyeikenberg/

Tony Martignetti - Chief Inspiration Officer at Inspired Purpose Coaching
At Inspired Purpose Coaching, we are on a mission to elevate leaders and equip them with the tools to navigate through change. We guide leaders who are ready to be elevated by clarifying their focus so they can transform their professional lives and realize their true potential.

I have over 20 years of experience in navigating people through change and unlocking their true potential.

Before sharing my experience as a coach, I was a finance and strategy professional with experience working with some of the world's leading life sciences companies. Along my journey, I also managed small businesses and ran a financial consulting company. Throughout my career, I have learned many lessons, not only as a leader but also working with high-performing leaders across multiple organizations. My passion for helping people has fueled my inspiration at Inspired Purpose Coaching.
https://www.linkedin.com/in/tonymartignett1/

Organizer and Moderator:

Dan Skiba, VP Printed Electronics Chasm Advanced Materials, Vice-Chair Boston ENET
As a Product Development Company Executive, I provide strategic leadership in product innovation and managing global teams, delivering award-winning products to the international market.  My ability to problem solve, direct the entire product development lifecycle, and gain commitment to a common goal have driven faster release of products and market penetration.  By building synergies across all Product Life Cycle disciplines, we have delivered products that result in 100% product utilization and seamless integration into customer environments. My skills in optimizing international resources have significantly reduced costs and streamlined production, delivering product excellence.
https://www.linkedin.com/in/dtskiba/

FURTHER INFORMATION:
Location:  Online Webinar
**Register Here:  https://bostonenet.org/events/teamwork-is-critical-for-startups-its-not-just-for-sports/**

*Antennas & Propagation, Geoscience & Remote Sensing, and Microwave Theory and Techniques Societies –*
*6:00PM, Wednesday, November 17*

# Overview of the NASA TROPICS Constellation Mission for Improved Observations of Tropical Cyclones

The Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of Smallsats (TROPICS) mission, selected by NASA as part of the Earth Venture–Instrument (EVI-3) program, will provide nearly all-weather observations of 3-D temperature and humidity, as well as cloud ice and precipitation horizontal structure, at high temporal resolution to conduct high-value science investigations of tropical cyclones. TROPICS will provide rapid-refresh microwave measurements (median refresh rate of approximately 40 minutes for the baseline mission) over the tropics that can be used to observe the thermodynamics of the troposphere and precipitation structure for storm systems at the mesoscale and synoptic scale over the entire storm lifecycle.

The TROPICS constellation mission comprises six CubeSats in three low-Earth orbital planes. Each CubeSat will host a high performance radiometer to provide temperature profiles using seven channels near the 118.75 GHz oxygen absorption line, water vapor profiles using three channels near the 183 GHz water vapor absorption line, imagery in a single channel near 90 GHz for precipitation measurements (when combined with higher resolution water vapor channels), and a single channel at 205 GHz that is more sensitive to precipitation-sized ice particles. TROPICS spatial resolution and measurement sensitivity is comparable with current state-of-the-art observing platforms. Three launches for the TROPICS constellation mission to be provided by Astra are planned in March, April, and May 2022. NASA's Earth System Science Pathfinder (ESSP) Program Office approved the separate TROPICS Pathfinder mission, which launched with 87 other small satellites on a SpaceX Falcon 9 into a sun synchronous orbit on June 30, 2021, in advance of the TROPICS constellation mission as a technology demonstration and risk reduction effort. The TROPICS Pathfinder mission will permit the checkout and optimization of all mission elements prior to the primary constellation mission.

This presentation will describe the recent development progress for the TROPICS Pathfinder and constellation missions and discuss the potential for groundbreaking science and operational missions performed from relatively low-cost small satellite platforms. Radiometric observations from the Pathfinder mission were first collected on August 2, 2021 and will be presented.

Dr. William J. Blackwell is the Associate Leader of the Applied Space Systems Group at MIT Lincoln Laboratory, where he leads a number of projects involving atmospheric remote sensing, including the development and calibration of airborne and space-borne microwave sensors, the retrieval of geophysical products from remote radiance measurements, and the application of electromagnetic, signal processing, and estimation theory.

Dr. Blackwell has served as associate editor of the IEEE Transactions on Geoscience and Remote Sensing and the IEEE Geoscience and Remote Sensing Society (GRSS) Magazine, cochair of the IEEE GRSS Remote Sensing Instruments and Technologies for Small Satellites working group, the NASA Aqua science team, and the National Academy of Sciences Committee on Radio Frequencies. He is currently the principal investigator on the NASA TROPICS Earth Venture mission and the MicroMAS (Micro-sized Microwave Atmospheric Satellite) missions. He was previously the Integrated Program Office sensor scientist for the Advanced Technology Microwave Sounder on the Suomi National Polar Partnership launched by NOAA in 2011 and the Atmospheric Algorithm Development team leader for the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Microwave Imager/Sounder.

Dr. Blackwell received the MIT Lincoln Laboratory Technical Excellence Award in 2019 for his "innovative contributions to the science and practice of environmental monitoring." He was selected as a 2012 recipient of the IEEE Region 1 Managerial Excellence in an Engineering Organization Award "for outstanding leadership of

the multidisciplinary technical team developing innovative future microwave remote sensing systems." In 2009, he was presented with the NOAA David Johnson Award for his work in neural network geophysical parameter retrievals and microwave calibration and is coauthor of "Neural Networks in Atmospheric Remote Sensing" (Artech House, 2009) and "Microwave Radar and Radiometric Remote Sensing" (Artech House, 2015). Dr. Blackwell has also been an author of more than 180 publications related to atmospheric remote sensing. He is a Fellow of the IEEE and an Associate Fellow of the AIAA.

Dr. Blackwell received the BEE degree in electrical engineering from the Georgia Institute of Technology and the SM and ScD degrees in electrical engineering and computer science from MIT, where he was a National Science Foundation Graduate Research Fellow.

IEEE seminar sponsored by AP-S, GRSS and MTT-S

https://us06web.zoom.us/j/88339227442?pwd=YXM-rbjNiUzd2d29Xb0w0cU8zcU5pZz09

Meeting ID: 883 3922 7442

Start Time:  6:00PM (Eastern Time)
Passcode: 711158
One tap mobile
+19294362866,,88339227442#,,,,*711158#  US  (New York)
+13017158592,,88339227442#,,,,*711158# US (Washington DC)
Dial by your location
     +1 929 436 2866 US (New York)
     +1 301 715 8592 US (Washington DC)
     +1 312 626 6799 US (Chicago)
     +1 669 900 6833 US (San Jose)
     +1 253 215 8782 US (Tacoma)
     +1 346 248 7799 US (Houston)
Meeting ID: 883 3922 7442
Passcode: 711158
Find your local number: https://us06web.zoom.us/u/kb-vf9ExsP8

*Power and Energy Society – 6:00PM, Tuesday, November 16*

# Grid Forming Battery Energy Storage for Improving the Reliability of the Eversource Cape Cod Distribution System

Speakers:  Ling Yang, Senior Engineer in Distribution Planning, Eversource Energy and Goodarz Ghanavati, PhD, Principal Engineer in Transmission Planning, Eversource Energy

**Registration:  https://site.ieee.org/boston-pes/event/technical-meeting-placeholder/?instance_id=837**

# VHDL Circuit Design, Simulation and FPGA Programming Using VIVADO

## Web-based Course with live Instructor!

**Times & Dates:** 11AM - 12 noon ET, February 15, 17, 22, 24, March 1, 3, 8, 10, 15, 17
**Speaker:** Orhan Gazi, Cankaya University, Ankara-Turkey
**Course Format:** Live Webinar, 10, one hour, sessions

**Introduction:** In this course VHDL circuit design language will be taught. VIVADO Platform will be used for VHDL coding, simulation and FPGA programming. The attendee should have basic knowledge of digital circuit design. VHDL language is an hardware design language. Its popularity is increasing in years. It is used to program FPGA devices. It is not exaggerating to say that most of the future electronic systems will include FPGA devices in their structures since FPGA devices are flexible, reconfigurable platforms for hardware designs. The attendee taking this course will learn VHDL language and he or she will be able to make digital circuit design using VHDL language. Besides, the attendee will learn how to program FPGA devices for circuits designed using VHDL.

**Prerequisite:** The one who is interested in taking this course should have basic knowledge of digital logic design. He or She should be familiar with the terms binary encoders, decoders, multiplexers, counters, registers, etc.

**Topics:**
Entity, Architecture and VHDL Operators
Project Creation Using VIVADO, Schematic, Synthesis
Internal Structure of FPGAs, LUTs, Slices
Combinational Logic Circuit Design and Concurrent Coding in VHDL
Testbench Writing and Simulation of VHDL Codes Using VIVADO
Constraint Files and FPGA Programming with VIVADO
User Defined Data Types in VHDL
Sequential Circuit Implementation in VHDL
Frequency Division in VHDL
Testing Sequential Logic Circuits on VIVADO
Packages, Components, Functions, and Procedures in VHDL
Fixed and Floating Point numbers in VHDL
Target Audience: Electronic and Communication Engineers, electronic engineers, computer engineers, engineers working in communication industry

**Benefits of Attending Course:**
1) The participant will learn how to design digital circuits using VHDL.
2) The participant will learn how to create projects and make simulations in VIVADO.
3) The participant will learn how to program an FPGA device.
4) The participant will have an idea about the architecture of FPGA device.

**Speaker Bio:** Prof. Orhan Gazi is the author of the book "A Tutorial Introduction to VHDL Programming" https://www.springer.com/gp/book/9789811323089

Prof. Orhan Gazi is the author of 10 books written in electrical engineering subjects. He is also one of the authors of the book "State Machines using VHDL: FPGA Implementation of Serial Communication and Display Protocols" which can be reached from https://www.springer.com/gp/book/9783030616977

The research area of Prof. Orhan Gazi involves "channel coding", and "digital communication subjects". Recently, he focuses on over capacity data transmission using polar codes. He is also interested in practical applications of communication systems involving FPGA devices. He is delivering courses with titles "VHDL circuit design", "interface design using VHDL for FPGA devices" and "system on chip design".

**Materials to be included:** Lecture slides will be provided.

**Decision (Run/Cancel) Date for this Course is Tuesday, February 8, 2022**

| | |
|---|---|
| IEEE Members | $250 |
| Non-members | $300 |

https://ieeeboston.org/event/vhdl-circuit-design-simulation-and-fpga-programming-using-vivado/?instance_id=3160

# State Machines and Timed State Machines in VHDL: FPGA Implementation of RS232, SPI and I2C Serial Communication Protocols

## Web-based Course with live Instructor!

**Times & Dates:**     11AM - 12 noon ET, March 22, 24, 29, 31, April 5, 7, 12, 14, 19, 21
**Speaker:**   Orhan Gazi, Cankaya University, Ankara-Turkey
**Course Format: Live Webinar, 10, one hour, sessions**

**Introduction:** State machines are used to characterize the behavior of digital electronic circuits. State machines are widely used in industrial applications. For instance, they are used in factories for control applications. State machines are also used in communication technology. It is essential for an electronic engineer to have knowledge of state machines and their practical implementations. In this course, we first provide information about state machines, and then teach the implementation of state machines in VHDL language. We use VIVADO platform for development, simulation and FPGA programming purposes. For practical applications, we implement serial communication protocols such as RS232, SPI, I2C in VHDL. We consider the VHDL implementation of SPI protocol for AD7303 device, and also we implement I2C protocol for ADT7420 Digital Temperature Sensor.

**Prerequisite:** Basic knowledge of VHDL circuit design.

**Topics:**
State machines and Modeling of Mathematical and Physical Problems by State Machines

Mealy and Moore State Machines

VHDL Implementation of Finite State Machines, Example Implementations

Timed State Machines and Their VHDL Implementations, Example Implementations

RS232 Asynchronous Serial Communication and its VHDL Implementation

Simulation of State Machines Using VIVADO

Serial Peripheral Interface and Its VHDL Implementation

Sine Signal Generation and SPI Protocol Development in VHDL for Digital to Analog Converter (DAC) AD7303

Inter Integrated (I2C) Serial Communication Protocol and Its Implementation in VHDL

VHDL Implementation of I2C Communication Between FPGA and ADT7420 Digital Temperature Sensor

**Target Audience:**  Electronic and Communication Engineers, electronic engineers, computer engineers, engineers working in communication industry

**Benefits of Attending Course:**
1) The participant will learn about state machines.
2) The participant will learn how to implement state machines in VHDL.
3) The participant will learn how to implement timed state machines in VHDL.

4) The participant will gain knowledge about serial communication protocols, RS232, SPI, and I2C.

5) The participant will learn how to use SPI, I2C protocols in VHDL for practical electronic devices AD7303 (DAC) and for ADT7420 Digital Temperature Sensor.

**Speaker Bio:**  Prof. Orhan Gazi is one of the authors of the book "State Machines using VHDL: FPGA Implementation of Serial Communication and Display Protocols" which can be reached from https://www.springer.com/gp/book/9783030616977

He is also sole author of the book "A Tutorial Introduction to VHDL Programming"

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The research area of Prof. Orhan Gazi involves "channel coding", and "digital communication subjects". Recently, he focuses on over capacity data transmission using polar codes. He is also interested in practical applications of communication systems involving FPGA devices. He is delivering courses with titles "VHDL circuit design", "interface design using VHDL for FPGA devices" and "system on chip design".

Materials to be included: Lecture slides will be provided.

**Decision (Run/Cancel) Date for this Course is, Thursday, March 17, 2022**

| IEEE Members | $250 |
| Non-members | $300 |

https://ieeeboston.org/event/state-machines-and-timed-state-machines-in-vhdl-fpga-implementation-of-rs232-spi-and-i2c-serial-communication-protocols/?instance_id=3150

# Call for Course Speakers/Organizers

IEEE's core purpose is to foster technological innovation and excellence for the benefit of humanity. The IEEE Boston Section, its dedicated volunteers, and over 8,500 members are committed to fulfilling this core purpose to the local technology community through chapter meetings, conferences, continuing education short courses, and professional and educational activities.

Twice each year a committee of local IEEE volunteers meet to consider course topics for its continuing education program. This committee is comprised of practicing engineers in various technical disciplines. In an effort to expand these course topics for our members and the local technical community at large, the committee is publicizing this CALL FOR COURSE SPEAKERS AND ORGANIZERS.

The Boston Section is one of the largest and most technically divers sections of the IEEE. We have over 20 active chapters and affinity groups.
If you have an expertise that you feel might be of interest to our members, please submit that to our online course proposal form on the section's website (www.ieeeboston.org) and click on the course proposal link (direct course proposal form link is **http://ieeeboston.org/course-proposals/** . Alternatively, you may contact the IEEE Boston Section office at ieeebostonsection@gmail.com or 781 245 5405.

- **Honoraria can be considered for course lecturers**
- Applications oriented, practical focused courses are best (all courses should help attendees expand their knowledge based and help them do their job better after completing a course
- Courses should be no more than 2 full days, or 18 hours for a multi-evening course
- Your course will be publicized to over 10,000 local engineers
- You will be providing a valuable service to your profession
- Previous lecturers include: Dr. Eli Brookner, Dr. Steven Best, Colin Brench, to name a few.

# Python Applications for Digital Design and Signal Processing

**Dates & Times:**   Thursday, November 11, 2021, videos released weekly 2x1.5 hours
Live Workshops:  7:00 - 8:00PM ET; Tuesdays, November 16, 23, 30, December 7

**Speaker:**   Dan Boschen

**Location:**   Zoom

**Last Notice Before Course Begins, Register Now!!!**

*This is a hands-on course combining pre-recorded lectures with live Q&A and workshop sessions in the popular and powerful open-source Python programming language.*

**New Format with Pre-Recorded Videos:**  The course format has been updated to release pre-recorded video lectures that students can watch on their own schedule, and an unlimited number of times, prior to live Q&A workshop sessions on Zoom with the instructor. The videos will also be available to the students for viewing for up to two months after the conclusion of the course.

**Overview:** Dan provides simple, straight-forward navigation through the multiple configurations and options, providing a best-practices approach for quickly getting up to speed using Python for modelling and analysis for applications in signal processing and digital design verification. Students will be using the Anaconda distribution, which combines Python with the most popular data science applications, and Jupyter Notebooks for a rich, interactive experience.

The course begins with basic Python data structures and constructs, including key "Pythonic" concepts, followed by an overview and use of popular packages for scientific computing enabling rapid prototyping for system design.

During the course students will create example designs including a sigma delta converter and direct digital synthesizer both in floating point and fixed point. This will include considerations for cycle and bit accurate models useful for digital design verification (FPGA/ASIC), while bringing forward the signal processing tools for frequency and time domain analysis.

**Jupyter Notebooks:** This course makes extensive use of Jupyter Notebooks which combines running Python code with interactive plots and graphics for a rich user experience. Jupyter Notebooks is an open-source web-based application (that can be run locally) that allows users to create and share visually appealing documents containing code, graphics, visualizations and interactive plots. Students will be able to interact with the notebook contents and use "take-it-with-you" results for future applications in signal processing.

**Target Audience:** This course is targeted toward users with little to no prior experience in Python, however familiarity with other modern programming languages and an exposure to object-oriented constructs is very helpful. Students should be comfortable with basic signal processing concepts in the frequency and time domain. Familiarity with Matlab or Octave is not required, but the equivalent operations in Python using the NumPy package will be provided for those students that do currently use Matlab and/or Octave for signal processing applications.
Benefits of Attending / Goals of Course: Attendees will gain an overall appreciation of using Python and quickly get up to speed in best practice use of Python and related tools specific to modeling and simulation for signal processing analysis and design.

***All set-up information for the installation of all tools will be provided before the start of class.***

**Topics / Schedule:**

*Pre-recorded lectures (3 hours each) will be distributed Friday prior to all Workshop dates. Workshop/Q&A Sessions are 7pm-8pm on the dates listed below:*

**Tuesday, November 16**
Topic 1: Intro to Jupyter Notebooks, the Spyder IDE and the course design examples. Core Python constructs.

**Tuesday, November 23**
Topic 2: Core Python constructs; iterators, functions, reading writing data files.

**Tuesday, November 30**
Topic 3: Signal processing simulation with popular packages including NumPy, SciPy, and Matplotlib.

**Tuesday, December 7**
Topic 4: Bit/cycle accurate modelling and analysis using the design examples and simulation packages

**Speaker's Bio:** Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing and developing transceiver hardware from baseband to antenna for wireless communications systems and has taught courses on DSP to international audiences for over 15 years. Dan is a contributor to Signal Processing Stack Exchange https://dsp.stackexchange.com/, and is currently at Microchip (formerly Microsemi and Symmetricom) leading design efforts for advanced frequency and time solutions.

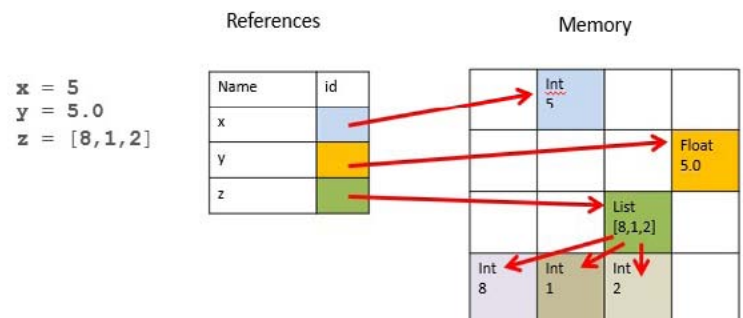For more background information, please view Dan's Linked-In page (https://www.linkedin.com/in/dan-boschen/)

**Decision (Run/Cancel) Date for this Course is Thursday, November 4, 2021**

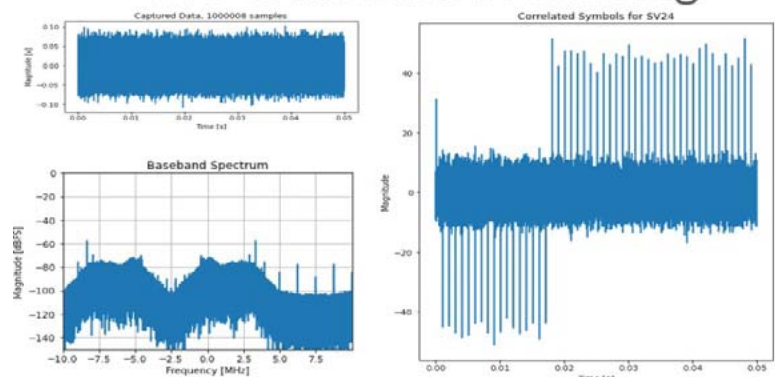| | |
|---|---|
| IEEE Members | $190 |
| Non-members | $210 |


Spyder IDE
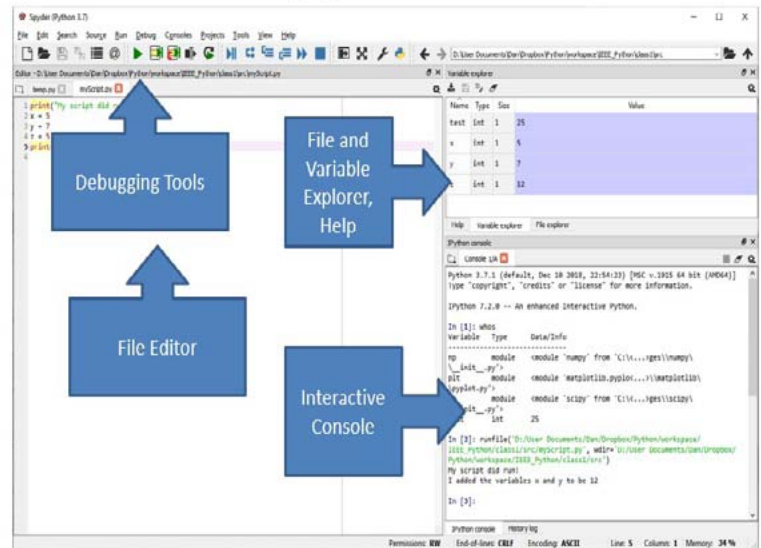

Mutable / Immutable


GPS Waveform Processing

**https://ieeeboston.org/event/pythonapplications/?instance_id=3109**

# Introduction to Practical Neural Networks and Deep Learning (Part I)

## Web-based Course with live Instructor!

**Times & Dates:**     9AM - 12:30PM ET, Saturday, March 19

**Speaker:**   CL Kim

**Course Format: Live Webinar, 3 hours of instruction!**

**Series Overview:**   From the book introduction: "Neural networks and deep learning currently provides the best solutions to many problems in image recognition, speech recognition, and natural language processing."

This Part 1 and the planned Part 2 (winter or spring 2022, to be confirmed) series of courses will teach many of the core concepts behind neural networks and deep learning.

More from the book introduction:  Reference book: "Neural Networks and Deep Learning" by Michael Nielsen, http://neuralnetworks and deeplearning.com  "We'll learn the core principles behind neural networks and deep learning by attacking a concrete problem: the problem of teaching a computer to recognize handwritten digits. …it can be solved pretty well using a simple neural network, with just a few tens of lines of code, and no special libraries."

"But you don't need to be a professional programmer."

The code provided is in Python, which even if you don't program in Python, should be easy to understand with just a little effort.

**Benefits of attending the series:**
* Learn the core principles behind neural networks and deep learning.
* See a simple Python program that solves a concrete problem: teaching a computer to recognize a handwritten digit.
* Improve the result through incorporating more and more core ideas about neural networks and deep learning.
* Understand the theory, with worked-out proofs of fundamental equations of backpropagation for those interested.
* Run straightforward Python demo code example.

The demo Python program (updated from version provided in the book) can be downloaded from the speaker's GitHub account. The demo program is run in a Docker container that runs on your Mac, Windows, or Linux personal computer; we plan to provide instructions on doing that in advance of the class.

(That would be one good reason to register early if you plan to attend, in order that you can receive the straightforward instructions and leave yourself with plenty of time to prepare the Git and Docker software that are widely used among software professionals.)

**Course Background and Content:**   This is a live instructor-led introductory course on Neural Networks and Deep Learning. It is planned to be a two-part series of courses. The first course is complete by itself and covers a feedforward neural network (but not convolutional neural network in Part 1). It will be a pre-requisite for the planned Part 2 second course. The class material is mostly from the highly-regarded and free online book "Neural Networks and Deep Learning" by Michael Nielsen, plus additional material such as some proofs of fundamental equations not provided in the book.

**Outline:**
Introduction to Practical Neural Networks and Deep Learning (Part 1)
Feedforward Neural Networks.
* Simple (Python) Network to classify a handwritten digit
* Learning with Gradient Descent
* How the backpropagation algorithm works

* Improving the way neural networks learn:
** Cross-entropy cost function
** Softmax activation function and log-likelihood cost function
** Rectified Linear Unit
** Overfitting and Regularization:
*** L2 regularization
*** Dropout
*** Artificially expanding data set
*** Hyper-parameters

**Pre-requisites:** There is some heavier mathematics in learning the four fundamental equations behind backpropagation, so a basic familiarity with multivariable calculus and matrix algebra is expected, but nothing advanced is required. (The backpropagation equations can be also just accepted without bothering with the proofs since the provided Python code for the simple network just make use of the equations.) Basic familiarity with Python or similar computer language.

**Speaker Background:**    CL Kim works in Software Engineering at CarGurus, Inc. He has graduate degrees in Business Administration and in Computer and Information Science from the University of Pennsylvania. He had previously taught for a few years the well-rated IEEE Boston Section class on introduction to the Android platform and API.

**Decision (Run/Cancel) Date for  this Course is Monday, March 14, 2022**

| | |
|---|---|
| **IEEE Members** | **$110** |
| **Non-members** | **$130** |

https://ieeeboston.org/event/neural networks/?instance_id=3181

# Call for Articles

Now that the Reflector is all electronic, we are expanding the content of the publication. One of the new features we will be adding are technical, professional development, and general interest articles to our members and the local technology community. These will supplement the existing material already in our publication.

Technical submissions should be of reasonable technical depth and include graphics and, if needed, any supporting files. The length is flexible; however, a four to five page limit should be used as a guide.  An appropriate guide may be a technical paper in a conference proceeding rather than one in an IEEE journal or transaction.

Professional development or general interest articles should have broad applicability to the engineering community and should not explicitly promote services for which a fee or payment is required. A maximum length of two to three pages would be best.

To ensure quality, technical submissions will be reviewed by the appropriate technical area(s). Professional/interest articles will be reviewed by the Publications Committee for suitability.The author will be notified of the reviewers' decision.

The Reflector is published the first of each month. The target submission deadline for the articles should be five weeks before the issue date (e.g., June 1st issue date; article submission is April 27). This will allow sufficient time for a thorough review and notification to the author.

We are excited about this new feature and hope you are eager to participate!
**Submissions should be sent to;
ieeebostonsection@gmail.com**

# CALL FOR PAPERS

## 2022 IEEE International Symposium on Phased Array Systems and Technology
### Revolutionary Developments in Phased Arrays

**11–14 October 2022**
**The Westin Waltham Boston**
**Waltham, Massachusetts, USA**
www.array2022.org

**IEEE BOSTON SECTION**

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### About the Symposium

Phased array systems continue to be a rapidly evolving technology with steady advances motivated by the challenges presented to modern military and commercial applications. This symposium will present the most recent advances in phased array technology and present a unique opportunity for members of the international community to interact with colleagues in the field of Phased Array Systems and Technology.

### Suggested Topics

- Array Design
- Array Measurements
- Beamforming & Calibration
- T/R Modules
- Radar Systems
- Communications Arrays
- Metamaterial Phased Arrays
- Array Signal Processing
- mmWave and Terahertz
- Wideband Arrays
- Dual Polarized Arrays
- Weather Radar Arrays
- Automotive
- MIMO

See webpage for more details

### Special Session Proposals

Please provide suggestions for special sessions to the Technical Program Chair at info@array2022.org

### Publication Information

All paper submissions must be in IEEE dual-column format and must be 2 pages (minimum) to 8 pages (maximum) in length including figures, and must be submitted in PDF format via the symposium website (www.array2022.org/call-for-papers). Additional instructions are on the website. All papers will be peer reviewed. Authors of papers presented at ARRAY 2022 conference will be invited to submit an expanded version to the IEEE T-MTT Mini-Special Issue.

### Important Dates

- Full paper submission
  (2-8 pages including figures)                12 March 2022
- Author notification                          30 April 2022
- Conference registration deadline
  for accepted authors                         01 Sept 2022

**Conference Committee**

**Conference Chair:**
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Jeffrey S. Herd, MIT LL
Eli Brookner, Raytheon (retired)
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Glenn Meurer, MITRE

**Primary Sponsor:**
IEEE Boston Section

# Software Development for Medical Device Manufacturers

## Web-based Course with live Instructor!
**(11 hours of instructions!)**

**Times & Dates: 9AM - 4PM ET, Tuesday & Wednesday, November 9 & 10**
**Speaker:   Steve Rakitin, Software Qualtiy Consulting**
**Course Format: Live Webinar**

**Last Notice Before Course Begins, Register Now!!!**

**COURSE SUMMARY:**  Developing software in compliance with the FDA Design Control regulation, changing FDA guidance documents and latest international standards is challenging. This intensive course provides practical solutions and suggestions for developing software in a manner that meets applicable FDA regulations, guidance documents and international standards, such as IEC-62304:2015. The focus is on interpreting Design Controls for software. Each section of the Design Controls regulation (820.30) is discussed from the perspective of software development. Discussions on key topics such as Software Requirements, Traceability, Design Reviews, Software Verification & Validation and Risk Management (including recently updated standards ISO-14971:2019 and EN-14971:2019) are included. Also discussed are FDA requirements for validation of software development tools and software used in Manufacturing and Quality Systems. Also discussed are recent FDA Guidance Documents on Cybersecurity, Mobile Apps, and Usability.

**THIS COURSE IS INTENDED FOR:**  Software engineers, project managers, quality managers, software quality professionals, RA/QA staff, and anyone who needs to develop cost-effective processes and procedures that will enable their organizations to deliver high quality software-based medical devices that comply with FDA regulations and international standards. This course is also appropriate for people who are new to the medical device industry. Course notes, access to an extensive collection of reference documents and a training certificate are provided.

**COURSE OUTLINE:**   This course will be presented with a live instructor using web-meeting software. The course content will be covered in 4 sessions as described below.

### SESSION 1 – Regulatory Context
Duration ~3 hours with one 15 min break
This session will cover key regulatory requirements for medical device software in the US and EU.

Regulations and Guidance:
• FDA Medical Device Regulation (21 CFR Part 820 – specifically, design controls)
• EU Medical Device Regulation
• FDA Guidance Documents:
• Guidance for Content of Pre-market Submissions for Medical Devices Containing Software
• Off-the-Shelf Software Use in Medical Devices
• General Principles of Software Validation
• Content of Premarket Submissions for Management of Cybersecurity in Medical Devices
• Policy for Software Device Functions and Mobile Medical Applications
• Applying Human Factors and Usability Engineering to Medical Devices

International Standards:
• ISO 13485:2016 Medical Devices – Quality Management Systems
• IEC 62304: 2015 Medical Device Software – Software Lifecycle Processes
• ISO 14971: 2019 Application of Risk Management to Medical Devices

• EN 14971: 2019 Application of Risk Management to Medical Devices
• Off-the-Shelf (OTS) Software and Open Source software (SOUP)
• Discussion: All Software Is Defective…

### SESSION 2 – FDA Design Controls and IEC 62304 – Part 1

Duration ~2.5 hours with one 15 min break
This session will cover FDA Design Controls and IEC 62304 requirements for medical device software.

• Design and Development Planning
    • How does Agile Development fit?
    • Medical Device Software Lifecycle Processes
• Risk Management
    • FDA Levels of Concern
    • IEC 62304 Software Safety Classification
• Software Requirements
    • Techniques for Removing Ambiguity from Requirements
• Software Architecture and Design
• Software Design Changes

### SESSION 3 – FDA Design Controls and IEC 62304 – Part 2

Duration ~2.5 hours with one 15 min break
This session will cover Software Verification and Validation requirements.

• Software Implementation
• Software Verification
    • Technical Reviews
    • Static Analysis
    • Unit and Integration Testing
• System Testing
• Software Validation Testing

### SESSION 4 – Software Tool Validation and Risk Management

Duration ~2.5 hours with one 15 min break
This session will cover Software Tool Validation and Risk Management requirements.
• Software Tool Validation

• Deciding which tools need to be validated
• Validation approach for software tools
• Validation of Manufacturing Software and Quality System Software
• Risk Management Using Fault Tree Analysis (FTA)
    • Review of ISO/EN 14971:2019 Requirements
    • Example of Fault Tree Analysis and Failure Modes Effect Criticality Analysis (FMECA)

**About the instructor:** Steven R. Rakitin has over 45 years experience as a software engineer. He has over 30 years of experience in the medical device industry and has been a medical device consultant for over 20 years. He has worked with over 100 medical device manufacturers and biotech companies worldwide, from startups to Fortune 100 corporations. He has published papers on medical device software risk management as well as a book titled: Software Verification & Validation for Practitioners and Managers.

He received a BSEE from Northeastern University and an MSCS from Rensselaer Polytechnic Institute. He earned certifications from the American Society for Quality (ASQ) as a Software Quality Engineer (CSQE) and Quality Auditor (CQA). He is a Senior Life member of IEEE.

Steve works collaboratively with medical device companies to help them comply with FDA regulations, guidance documents, and international standards in an efficient and cost-effective manner.

**Decision (Run/Cancel) Date for this Course is Wednesday, November 3, 2021**

| **IEEE Members** | **$285** |
| **Non-members** | **$345** |

http://ieeeboston.org/event/live-course-software-development-for-medical-device-manufacturers/

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September 2021

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**eBook**

5G OTA Testing Guide

October 2021

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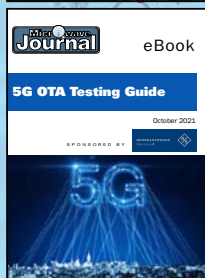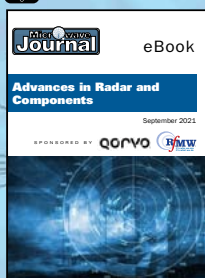
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## VIRTUAL PANEL SESSIONS

**Interesting IoT Technologies for the Future**

Nov 17          11am ET

## ELEARNING CENTER

Access webinars on-demand from the archived webinars and events page

**2021 Virtual IEEE International Symposium on Technologies for Homeland Security**

November 8 - 9, 2021

info@ieee-hst.org

IEEE Advancing Technology for Humanity

Co-Sponsor: IEEE★USA
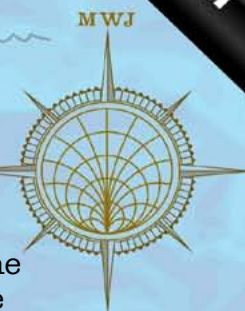
# IEEE HST Virtual Symposium Coming in November!

COMPLIMENTARY REGISTRATION AVAILABLE!

## HST Symposium Coming 8 – 9 November 2021

*The 20th IEEE Symposium on Technologies for Homeland Security (HST '21 will be held November 8 - 9, 2021 as a virtual symposium. This symposium brings together innovators from leading academic, industry, businesses, Homeland Security Centers of Excellence, and government agencies to provide a forum to discuss ideas, concepts, and experimental results.*

Produced by IEEE with technical support from IEEE, IEEE Boston Section, and IEEE-USA and organizational support from MIT Lincoln Laboratory and Raytheon, this year's event will once again showcase selected technical papers and posters highlighting emerging technologies in:

Cyber Security

Frontier and Emerging Technologies

Climate and Homeland Resilience

Border Security, Critical Infrastructure Protection & Law Enforcement

## See IEEE-HST.ORG for more details!