

BOSTON



THE REFLECTOR

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2024 IEEE INTERNATIONAL
SYMPOSIUM ON PHASED
ARRAY SYSTEMS AND
TECHNOLOGY

P.7

2023 IEEE HIGH
PERFORMANCE EXTREME
COMPUTING CONFERENCE
(HPEC) - CALL FOR PAPERS

P.9

PROF. DEV. TRAINING:
PYTHON APPLICATIONS FOR
DIGITAL DESIGN AND SIGNAL
PROCESSING

P.19

PROF. DEV. TRAINING:
DIGITAL SIGNAL PROCESSING
(DSP) FOR WIRELESS
COMMUNICATIONS

P.21

PROF. DEV. TRAINING:
DIGITAL SIGNAL PROCESSING
(DSP) FOR SOFTWARE RADIO

P.23

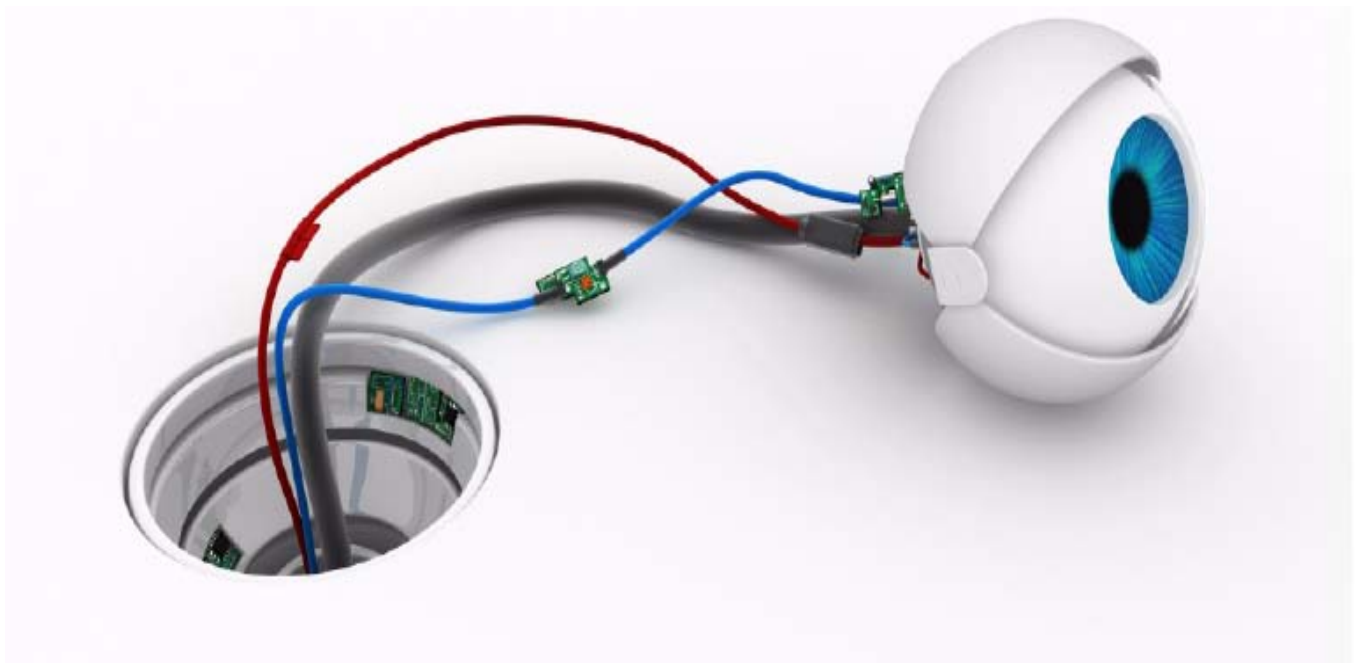


TABLE OF CONTENTS

Editorial - “Breaking Bad”, by Karen Panetta, Reflector Editor	Page 3
IEEE Boston Section Online, self-paced, on-demand courses	Page 6
2024 IEEE International Symposium on Phased Array Systems and Technology	Page 7
IEEE Video Series (Five videos on issues and technologies that impact planet Earth), and Call for Articles of Interest	Page 8
IEEE 2023 Conference on High Performance Extreme Computing - Call for Papers!	Page 9
Signal Processing, and Education Societies, Women in Engineering	Page 10
Entrepreneurs’ Network and Technology & Management Society	Page 11
Electromagnetic Compatability Society	Page 12
Microwave Theory & Technology Society (Boston Chapter)	Page 13
New Hampshire Section Microwave Theory & Technology, Antennas & Propagation Societies	Page 14
Entrepreneurs’ Network	Page 15
Power & Energy Society	Page 15
Aerospace and Electronic Systems, and Robotics & Automation Societies	Page 16
Advertise With Us!, and Call for Course Speakers/Organizers	Page 17
IEEE Student ComSoc School (6G Communications and Wireless Technology)	Page 18
Python Applications for Digital Design and Signal Processing	Page 19
(Last Notice Before Course Begins, Please Register Now!!!)	
Digital Signal Processing (DSP) for Wireless Communications	Page 21
Digital Signal Processing (DSP) for Software Radio	Page 23



Breaking Bad

Karen Panetta, Reflector Editor

How do you describe what you do at work to laymen? One of my first professional positions was as a diagnostic engineer. I would try in earnest to explain what I did with enthusiasm, but I could never manage to avoid the “glazed over look” threshold. This is the time limit where the person you are speaking to “glazes over” and looks for an escape. Family and friends had no idea what I did so after a while, it was easier to say, “What I do is proprietary,” and move the conversation on to another subject like the weather.

Of course, my father wouldn’t let me get away with this answer. He insisted that if someone was paying me good money, I must be doing something “useful”. He was right. I needed to find a way to explain the value of what I was doing and perhaps not just focus on the process of how I went about doing my job.

My new answer was “I break things and I am very good at.” As a matter of fact, I am now convinced that breaking things is a genetic trait I inherited. I can test the reliability, functionality and usability of almost anything. Have you ever purchased or used a product and asked yourself “Did they even bother to test this thing with real users?” I am sure you have.

I have been plagued by poor quality user interfaces and designs that claim to be simple or intuitive to use. Take for example, motion sensor based soap dispensers and paper towel dispensers. I think it is great that in an attempt to avoid a germ fest, public restrooms have tried to use touch free devices. However, I notice many of them always seem to be smashed and never quite operating properly. At first, I thought the smashed casings were the result of malicious vandalism, but then I dis-

covered the real reason was due to a non-intuitive user interface.

I witnessed older women in the restroom who couldn’t figure out how to get the paper towels out of the dispenser or how to turn on the motion activated water faucets. They banged on the sensor thinking it was some sort of button. Even after I told them it was a motion sensor and they had to wave their hand in front of the device, they placed their hands firmly on the sensor and began rubbing it as one would do as if expecting a genie to pop out. When they were finally successful at having the dispenser activate, the tiny piece of paper towel that came out was so puny that a square of toilet tissue would have been more useful. This frustrated the women even more and they kept waving furiously at the dispenser, which wouldn’t sacrifice another piece of towel. I then had to explain that unless they tore off the exposed piece, a new one wouldn’t come out. They left cursing the technology.

The directions on the front cover of the dispenser simply showed a tiny hand waving and in small type were the words “motion activated.” There was no mention of having to rip off the visible piece before another piece would come out. I couldn’t blame the women for their frustration and was disappointed that a lousy user interface was giving sensors a bad reputation.

At the next IEEE Boston Executive Committee meeting, I noticed many new renovations at our meeting venue. There were now brand new motion activated soap dispensers in the restrooms. I put my hand under it, waved, rocked back and forth, and prayed to the almighty sensor deity for soap. Alas, no soap. As I walked away

from the sink, I heard the soap dispenser make a noise and plop out a foam burst that landed on the counter-top.

“Hmmm, quite a time delay,” I thought as I moved to the next sink to try another dispenser. This dispenser wouldn’t work at all.

Finally, a hotel manager walked in and I said, “Don’t you think that you should complain that these brand new dispensers are not functioning properly?”

“Oh, they do work”, said the manager, “You just need to block out the lights above the sink with one hand, until you get the soap in your free hand.”

Apparently, the sensors were confused by the lights that were positioned directly above the dispensers. All I could think of was, “Who tested these things and how many calories did I just burn by dancing around in front of these sinks?”

Let’s leave the potty humor behind and move on to my last example of poor user interfaces.

Like most modern homes, I have a “man cave”, only mine is called, “Daddy’s room”. For those of you that don’t know what a “man cave” is, it’s a high tech entertainment room complete with flat screen TV, DVD, gaming system and a surround sound acoustic system. My father loved this room but unfortunately, I had to be his personal remote control because he couldn’t figure out how to play a movie or even turn on the TV with the remote control. Of course, this wouldn’t do, so I went out and bought a universal remote that claimed to be the most intuitive device available. I am ashamed to tell you how much I paid for this thing, but you must understand I was desperate.

I left the new remote control in his room and left to go on travel. I was in a meeting when he called me, but left the meeting to take this important call. He was calling to complain bitterly about the stupid remote control I left him.

He explained that he saw an “on” button and pushed it. The TV turned on but without the sound. Apparently, I didn’t get the more expensive model that would work through the coffee table that was in front of the receiver. So, I told him he had to stand up and aim it at the receiver. He tried again, and again the TV came on with no sound. I had never used the device myself so I couldn’t imagine what was wrong with it.

When I read the user manual, I discovered that the remote control had a touch screen with 2 options displayed, namely “TV” or “movie”. There was no, “touch here to turn on the TV” or instructions to help him. I couldn’t blame him and couldn’t understand why they put an “ON/OFF” button on the device when it had a touch screen that achieved the same function. Furthermore, why would pushing the On/Off button on the device default to turning on the TV without any sound?

When I returned home, I begged for his forgiveness and gave him an IEEE hat to appease him, along with some nice baked goods.

He gave me a lecture about wasting money on “junk technology” and then proudly held up his own home-made solution.

“Here,” he said, “My remote doesn’t require a Ph.D. to operate it.” He had made a long stick with wooden fingers at the end of it that fit perfectly over the television buttons. By simply applying a little pressure to the control panel buttons, he could now operate the TV from 4 feet away while sitting in his reclining chair.

He joked with me and promised to make me another remote specifically to play movies and offered his design for half the price of my so called “highway robbery useless remote”.

He trained my little boy to be just as good at “breaking things” as he did for me. Now, I have a future engineer who excels as a user interface tester, who will help us all save the good name of technology. Thank you for this legacy Daddy, I miss you.



What + If = IEEE

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iee.org/membership

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COMMUNITY

PROFESSIONAL DEVELOPMENT

CAREER ADVANCEMENT

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/>



2024 IEEE INTERNATIONAL SYMPOSIUM ON PHASED ARRAY SYSTEMS AND TECHNOLOGY

Returning to Boston in the Fall of 2024

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.



Important Dates and Call for Papers will be posted to the Symposium Web Site after May 1, 2023!

IEEE-ARRAY.org

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 diverse 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.

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", "Green Energy's Economic Progress", and "Net-Zero CO2 with Nuclear, Hydrogen and Geothermal". 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, ieebostonsection@gmail.com.

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;
ieebostonsection@gmail.com

27th Annual IEEE High Performance Extreme Computing Virtual Conference 25 - 29 September 2023

CALL FOR PAPERS

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Administrative Contact

Mr. Robert Alongi
IEEE Boston Section

The IEEE High Performance Extreme Computing Conference (HPEC '23) will be held virtually 25 – 29 September 2023. The HPEC charter is to be the premier conference in the world on the confluence of HPC and Embedded Computing.

The technical committee seeks new presentations that clearly describe advances in high performance extreme computing technologies, emphasizing one or more of the following topics:

- AI / Machine Learning
- Graph Analytics & Network Science
- Advanced Multicore Software Technologies
- Advanced Processor Architectures
- Automated Design Tools
- Big Data & Distributed Computing
- Big Data Meets Big Compute
- Case Studies & Benchmarking of Applications
- Cloud HPEC
- Computing Technologies for Challenging Form Factors
- ASIC & FPGA Advances
- Quantum and Non-Deterministic Computing
- Data Intensive Computing
- Digital Front Ends
- Fault-Tolerant Computing
- Embedded Cloud Computing
- General Purpose GPU Computing
- High Performance Data Analysis
- Interactive and Real-Time Supercomputing
- Mapping & Scheduling of Parallel & Real-Time Applications
- New Application Frontiers
- Open System Architectures
- Cyber Analysis and Secure Computing

HPEC accepts two types of submissions:

1. Full papers (up to 6 pages, references not included. Additional pages can be purchased for \$200/page).
2. Extended abstracts (up to 2 pages, references included).

IMPORTANT DATES:

Submission Deadline: **JUL 07, 2023**
Notification of Acceptance: **AUG 15, 2023**
Camera Ready Deadline: **AUG 31, 2023**

Submissions to HPEC '23 will be accepted through the CMT submission site at:

<https://cmt3.research.microsoft.com/HPEC2023/>

Preference will be given to papers with strong, quantitative results, demonstrating novel approaches or describing high quality prototypes. Authors of full papers can mark their preference for a poster display or an oral presentation. Presenters who wish to have hardware demonstrations are encouraged to mark their preference for a poster display. Accepted extended abstracts will be displayed as posters. Papers can be declared "student paper" if the first author was a student when doing the presented work and will be eligible for the "IEEE HPEC Best Student Paper Award." Papers should not be anonymized. All paper and extended abstract submissions need to use the approved IEEE templates. Full paper submissions with the highest peer review ratings will be published by IEEE in the official HPEC proceedings and may be available on IEEE eXplore. All other accepted submissions and extended abstracts are published on ieee-hpec.org.

Vendors are encouraged to sign up for vendor booths. This will allow vendors to present their HPEC technologies in an interactive atmosphere suitable for product demonstration and promotion. We welcome input (hpec@ieee-hpec.org) on tutorials, invited talks, special sessions, peer reviewed presentations, and vendor demos. Instructions for submitting will be posted on the conference web site shortly.

IEEE-HPEC.org

Signal Processing, and Education Societies, Women in Engineering – 6:00PM, Tuesday, April 4

Exceptional Leaders in STEM

Guest speaker Anu Gokhale, Tufts University, School of Engineering

INFORMATION AND EVENT REGISTRATION -
https://tufts.qualtrics.com/jfe/form/SV_2tKCYuSI-hRKYbEW

Dinner Served at 6:00 pm, and lecture is from 6:30–8:30 pm EST

Location: Alumnae Hall, 40 Talbot Avenue, Medford MA 02155, and on zoom.

This is a Notation Track workshop. Development Domain: Leadership and Collaboration, Personal Development

Guest speaker, Anu Gokhale, is invited to Tufts as one of the exceptional leaders in STEM. Anu will talk about her research and share her insights on becoming a leader.

The in-person event is open to Tufts graduate students and post docs, and industry professionals in STEM fields.

The zoom webinar is open to the public.

Dr. Anu A. Gokhale is currently a Professor and Chair of the Department of Computer Information Systems at Saint Augustine's University. Formerly, she was a Distinguished Professor and Coordinator of the Computer Systems Technology program at Illinois State University (ISU). Gokhale has completed thirty years as faculty and has received several College and University research,

teaching and service awards. She was in Cairo, Egypt in August 2022 as Fulbright Specialist in Data Analytics. Gokhale was named Fulbright Distinguished Chair in STEM+C at the University of Pernambuco, Brazil, 2016-17; was a Faculty Fellow in Israel and Fulbright Specialist in Cybersecurity in India during summer 2017. As a Visiting Professor in College of Business at Shandong University in Jinan, China in spring 2017, her focus was on e-commerce. Her achievements encompass extensively cited refereed publications; groundbreaking externally funded research supported by a continuous 20-year stream of grants from state and federal agencies including the National Science Foundation; and elevation of the ISU student experience through excellence in teaching, mentorship, and the creation of opportunities for students to get involved in research.

Originally from India, she has a master's in physics-electronics from the College of William & Mary, and a doctorate from Iowa State University. Dr. Gokhale authored a second edition of her book Introduction to Telecommunications, which has an international edition in Chinese. She continues to be an invited keynote speaker at various conferences. She is an active volunteer in IEEE and was honored with the IEEE Third Millennium Medal and 2019 Region 4 Outstanding Professional Award. She consults for business and industry to increase productivity using data analytics and business intelligence while leveraging e-technologies. Gokhale has delivered multiple workshops focusing on inclusion & diversity as well as "STEM for All" public policy.

*Entrepreneurs' Network and Technology & Engineering Management Society –
7:00PM, Tuesday, April 4*

Dealmaking: Licensing, Strategic Partnerships and More

Location: Science and Technology Center, Lasell University, Newton, MA

Information and registration for this event will be posted shortly at <https://bostonenet.org/events/dealmaking-licensing-strategic-partnerships-and-more/>

Online Participation: Zoom links will be sent to all registrants after registration.

Agenda:

7:00 PM - Introduction, ENET Chairperson's announcements
7:10 PM - eMinute Pitch, up to 3 Startup pitches
7:25 PM - Expert Panel, 4 expert speakers on the night's topic
8:10 PM - Moderator and Audience Q & A with the speakers
8:30 PM – Networking - Panelists will be available afterward for responses to individual questions

TEMS National: The Engineering Management Society (EMS) was founded in 1951, becoming the Technology Management Council (TMC) in 2007. In 2015 we transitioned to the Technology and Engineering Management Society, (TEMS). The Boston TEMS Chapter has been approved by Section and IEEE HQ during 2017 and had is serving Boston area with its programs since inception 2018.

Vision, Mission, Values at <http://www.ieee-tems.org/>

Membership: <https://www.ieee.org/membership-catalog/productdetail/showProductDetailPage.html?product=MEMTEM014>

About Boston TEMS Chapter: Technology and Engineering Management (TEM) Society, Boston Chapter is for Engineering Managers and Executives from Engineering, Science and Technology based organizations. All those aspiring to become proficient and Savvy Leaders are welcome.

We provide a forum to facilitate knowledge sharing to make strategic and critical decisions. We draw upon real-life scenarios from across the spectrum of engineering specialties. Our meetings will serve those looking to Manage Engineering Programs, Projects and Technologies. You can learn from leaders, get mentored by experts, share experiences and network with accomplished professionals.

We invite all our Technology and Engineering Management (TEM) Society members, Non-members and interested engineering executives in technology and engineering to participate in this meeting.

Please Confirm Participation by sending email to nirmayee.dighe1998@gmail.com.

First 20 confirmations will get coupon code to register for free from Nemo.

TEM Chapter Leadership Karthik Ganesan Chair, TEM and Ananda Chakravarty, Chair- Technical Activities committee. Nirmayee Dighe, Grad Student, Volunteer

Electromagnetic Compatibility Society – 4:00PM, Wednesday, April 5

Smart Grid EMC Standards

Speaker: Mr. Jerry Ramie - Founder, ARC Technical Resources



Location: Zoom Presentation

The Boston chapter of the IEEE EMC Society present this award winning lecture on standards development.

This presentation describes the IEEE standards work undertaken in the last six years on refining the immunity testing requirements for devices with communications functions. The new P1613 draft harmonizes closely with the current IEC requirements for electric utility equipment with some differences. Its harmonized Scope includes most utility-owned smart grid equipment controls with a COM port or COM functionality.

Jerry Ramie is a 42-year veteran of the EMC test and measurement business. He is Secretary of the AN-SC-C63® Committee on EMC, a 2011 Distinguished Lecturer for the EMC Society on Smart Grid, our liaison to the Power & Energy Society, an iNARTE-certified EMC technician and a Life Senior Member of the IEEE. He can be reached at: jramie@arctechnical.com.

Join Zoom Meeting <https://us02web.zoom.us/j/87295366111?pwd=eG1EMmxmRFdNYmd1UUhE-UkRBQVNEUT09> Meeting ID: 872 9536 6111 Passcode: 810040 One tap mobile +16469313860,,87295366111#,,,,*810040# US +13017158592,,87295366111#,,,,*810040# US (Washington DC)

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IEEE Boston Section is the largest, most active, and technically diverse section in the U.S. Comprised of Engineers, scientists and professionals in the electrical and computer sciences and engineering industry

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Microwave Theory & Techniques Society – 6:00PM, Monday, April 10

RF Design for Ultra-Low-Power Wireless Communication Systems

Dr. Jasmin Grosinger of Graz University of Technology, Institute of Microwave and Photonic Engineering, MTT-S Distinguished Lecturer



The MTT-S Boston Chapter will be holding a Distinguished Microwave Lecture (DML) on April 10th, 2023 from 6pm-8pm EST at MIT LL 3 Forbes Road cafeteria in Lexington, MA. Dr. Jasmin Grosinger will give a talk titled “RF Design for Ultra-Low-Power Wireless Communication Systems”. We

encourage in-person attendance but the event will be hybrid and can be registered for on v-Tools. Light refreshments will be served and no admission is charged.

Registration:

<https://events.vtools.ieee.org/m/351788>

Hybrid - Virtual and On-site. Virtual attendance information will be emailed to registered participants approximately 24 hours prior to the event.

Onsite - MIT Lincoln Laboratory, 3 Forbes Rd, Lexington, Massachusetts, Room Number: Cafeteria

In this talk, Dr. Grosinger will present radio frequency (RF) design solutions for wireless sensor nodes to solve sustainability issues in the Internet of things (IoT), which arise due to the massive deployment of wireless IoT nodes on environmental and economic levels. Engineers can apply these RF design solutions to improve the ultra-low-power operation of IoT nodes, avoid batteries' eco-toxicity, and decrease maintenance costs due to battery replacement.

The presented solutions offer high integration levels based on system-on-chip and system-in-package concepts in low-cost complementary metal-oxide-semiconductor technologies to limit costs and carbon footprints of these nodes. Within this research context, I will present solutions for ultra-low-power wireless communication systems based on high frequency (HF) and ultra-high frequency (UHF) radio frequency identifica-

tion (RFID) technologies. In particular, I will present RF design solutions for HF and UHF RFID systems that reveal how to develop passive miniaturized IoT nodes that operate robustly in harsh application environments and how to create batteryless or rather passive IoT nodes, which provide passive sensing capabilities and work robustly in their respective application environment.

Jasmin Grosinger is an Associate Professor at the Graz University of Technology, Austria. After receiving her MSc from the Vienna University of Technology, Austria, she was a Project Assistant with the Institute of Telecommunications, Vienna University of Technology, and a Laboratory Associate with Disney Research, Pittsburgh, USA. In 2012, she received her PhD from the Vienna University of Technology. Since 2013, Jasmin has been with Graz University of Technology, working on ultra-low-power microwave components and systems at the Institute of Microwave and Photonic Engineering. I

In recent years, she also was a Guest Professor at the Institute of Electronics Engineering, Friedrich-Alexander-University Erlangen-Nuremberg, Germany. Jasmin is an IEEE Senior Member, has authored more than 70 peer-reviewed publications, and holds one US patent. She is actively involved in the Technical Program and Steering Committees of various microwave-related conferences and is an Associate Editor of the IEEE Microwave and Wireless Technology Letters. She is a member of the IEEE Microwave Theory and Techniques Society (MTT-S). Within MTT-S, she serves as a Distinguished Microwave Lecturer (Tatsuo Itoh DML class of 2022–2024). Since 2023, she has served as an Elected Voting Member of the IEEE MTT-S Administrative Committee (AdCom).

Email: jasmin.grosinger@tugraz.at

*New Hampshire Section - Microwave Theory & Technology, and Antennas & Propagation Societies—
6:00PM, Monday, April 17*

RF Design for Ultra-Low-Power Wireless Communication Systems

Jasmin Grosinger, Ph.D., MTT-S Distinguished Lecturer

Time: 6:00PM to 07:15PM

Location: Nashua Public Library, 2 Court Street,
Nashua, NH 03060

Room #: Theater Room

Agenda:

6:00 PM to 6:15 PM - Meet and greet

6:15 PM to 7:15 PM - Presentation

7:15 PM - Optional dinner with speaker at a nearby restaurant

For more information and Registration:

<https://events.vtools.ieee.org/m/351134>

In this talk, I will present radio frequency (RF) design solutions for wireless sensor nodes to solve sustainability issues in the Internet of things (IoT), which arise due to the massive deployment of wireless IoT nodes on environmental and economic levels. Engineers can apply these RF design solutions to improve the ultra-low-power operation of IoT nodes, avoid batteries' eco-toxicity, and decrease maintenance costs due to battery replacement.

The presented solutions offer high integration levels based on system-on-chip and system-in-package concepts in low-cost complementary metal-oxide-semiconductor technologies to limit costs and carbon footprints of these nodes. Within this research context, I will present solutions for ultra-low-power wireless communication systems based on high frequency (HF) and ultra-high frequency (UHF) radio frequency identification (RFID) technologies. In particular, I will present RF

design solutions for HF and UHF RFID systems that reveal how to develop passive miniaturized IoT nodes that operate robustly in harsh application environments and how to create batteryless or rather passive IoT nodes, which provide passive sensing capabilities and work robustly in their respective application environment.

Come hear IEEE 2023 MTT-S Distinguished Lecturer (DL) Dr. Jasmin Grosinger's presentation on her work in ultra-low power wireless systems. In the Connectivity for Everything that will come with 6G, there will be a massive deployment of wireless nodes (estimates of $(10^7 \text{ devices})/(\text{km}^2)$) and engineers are working on the RF design challenges to address the sustainability issues at both the environmental and economic level that will come with such a deployment. This presentation will show how these issues are being addressed, and will be very interesting to MTT/AP-S members as well as all in the IEEE. Dr. Grosinger brings over 10 years of microwave/RF experience, in both academic R&D and industry in Austria, the US, and Germany to her role as an IEEE MTT-S DL. See the full presentation abstract below. Everyone is welcome, from practitioner to retiree, and student. IEEE events are open to all; you do not have to be a member to attend. Register here <https://events.vtools.ieee.org/m/351134>.

Parking at the Nashua Public Library's parking lot is paid by the hour, via parking meters; see the lot's \$/hr rates and location along the southern bank of the Nashua River at <https://www.nashuanh.gov/DocumentCenter/View/6306/Downtown-Parking-Brochure-PDF?bidId=>.

Entrepreneurs' Network – 7:00PM, Tuesday, April 18

Grants & Non-dilutive Funding

Location: CIC, One Broadway, Cambridge, MA
Information and registration for this event will be posted shortly at <https://bostonenet.org/events/grants-non-dilutive-funding/>

Online Participation: Zoom links will be sent to all registrants after registration.

Agenda:

7:00 PM - Introduction, ENET Chairperson's announce-

ments

7:10 PM - eMinute Pitch, up to 3 Startup pitches

7:25 PM - Expert Panel, 4 expert speakers on the night's topic

8:10 PM - Moderator and Audience Q & A with the speakers

8:30 PM – Networking - Panelists will be available afterward for responses to individual questions

Power & Energy Society – 6:00PM, Tuesday, April 18

The Story of Boston's L Street Power Station 1898-2006

Speaker: Gilmore Cooke, PE, IEEE Boston Executive Committee and Historian



Time: Refreshments start at 6:00pm; Talk begins at 6:30pm

Location: Wentworth Institute of Technology Beatty 426 (Building: Beatty Hall) 550 Huntington Ave, Boston, MA 02115 (Free Parking at West Parking Lot)

This presentation will illustrate the history of the power plant beginning in the late 1890s, including images of the original construction taken from the late 1890s through the 1900's. The talk will feature early vertical turbines by manufactured GE, vintage switchboards, and interior and exterior images preserved at the Harvard's Baker Library. Why is the history of this station so important? Throughout its long history, the L Street Power Station has used and often pioneered the use of the newest and best technologies and it is where many electric power related accomplishments were made, finding application to this day. Today, this 100 ++ year old power plant in the South Boston district is being repurposed for commercial/residential use.

Gilmore Cooke received the Bachelor of Engineering degree in Electrical Engineering from McGill University Montreal in 1962. He has spent most of his career working on large engineering and construction projects in California, the mid-west and Massachusetts. He is

a Registered Professional Engineer in Massachusetts, California, Rhodes Island and other states. Mr. Cooke is an active member of the IEEE Boston Section. He served as chairman and director of the IEEE Detroit Chapter and has been active with technical programs in Boston during the 80's. He was appointed chairman of the Industry Application Society's History Committee. He served on the 2004 committee of the IEEE Center of History. He's written numerous papers and articles for the IEEE and the SIA - Society for Industrial Archeology, both at the regional and national levels. He was appointed chair of Boston's History and Milestones Committee, responsible for investigating and proposing IEEE milestones for the Boston Section. Historically, his interests include the evolution electricity in New England, central power stations, large electrification projects, and Fred Stark Pearson. Gil has authored "The Story of L Street Generating Station: 1898 to 2006"; and a comprehensive biography of Fred Stark Pearson

Free and Open to the Public; RSVP is appreciated Visit the IEEE PES Boston Chapter website for further details - <https://site.ieee.org/boston-pes/>

For any questions regarding this presentation or any IEEE PES Boston Technical Meetings, please contact Risa Karanxha (risa.karanxha@nationalgrid.com)

Aerospace and Electronic Systems, and Robotics and Automation Societies - 6:00PM, April 26

New Drone Operations: UAV Technology, Regulations, and Applications

Speaker: Vince Socci, CTO of On Target Motion and Director of Product Cost at Blue Origin,
Distinguished Lecture



Place: Aurora Flight Sciences (a Boeing Company), 314 Main St, 17th Floor, Cambridge, MA, USA.

Drone operations are becoming more commonplace in society. Any adult may purchase a drone for hobby operation and may choose to pursue licensing for commercial operation. The skills needed to understand and properly use a drone must be learned in order to become a successful operator. A new pilot may become more effective by understanding drone technology. A new business operator can be more profitable by understanding relevant drone applications. The FAA maintains rules for drone registration, pilot licensure, and operation.

The purpose of this lecture is to prepare the public to be knowledgeable users of drone technology, effective strategists in drone business applications, and good citizens of drone operator regulations and policies. An orientation of UAV technology, operating regulations, and business applications is provided.

Vince Socci is the CTO of On Target Motion and the Director of Product Cost at Blue Origin. At OTM, he provides engineering services for aerospace, automotive, rail, marine, and other safety-critical applications. At Blue Origin, he manages the product cost of rocket engines. Previously, he led National Instruments automotive business development throughout the Americas, where he provided business and technical support for customers in automotive, off-highway, and rail validation applications, with emphasis in electric vehicles and ADAS. With 30 years of experience in aerospace, automotive, rail, power electronics, and medical systems, he has engineered systems in the most complex appli-

cations. His specialized areas of interest are embedded controls, real-time test, and systems engineering for vehicle-based applications.

In the early 90's, Socci designed the first electronics for the Cummins B-series diesel engine, which are still in use today. In the mid-90's, he developed power controllers for GE locomotives. Late-90's and 2000's, he led the development of the HybriDrive HEV powertrain, which was used on various platforms from commercial buses and taxis to military trucks. Through the 2000's and 2010's, he led the development of aero and auto vehicle control systems for power, communications, fueling, radar, motor controls, and unmanned systems. He was the Director of Large Transport Fuel Systems for Parker Aerospace, leading the development of the A350XWB aircraft to first flight. Socci then developed advanced validation systems for automotive powertrain, body/chassis, and autonomous applications, using simulation/emulation architectures, products, and workflows to solve automotive product development challenges. Currently, he is focused on aerospace innovation including commercial space transportation and UAV development.

He holds a BS in electrical engineering, MS in electrical engineering and MBA in technology management. Socci has served on the Board of Directors and governing boards of several professional societies, including IEEE, SAE, and PMI. He also serves as an expert witness in aerospace, automotive, and medical device litigation.

IMPORTANT Note: To access the venue it is necessary to have a valid ID

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Advertising with the IEEE Boston Section affords you access to a highly educated, highly skilled and valuable consumer. Whether you are looking to reach students with a bright future and active minds, or whether you are reaching households with priorities that may include a family, planning for vacations, retirement, or like-values, the IEEE Boston Section is fortunate to enjoy a consistent relationship. The IEEE Boston Section provides education, career enhancement, and training programs throughout the year. Our members, and consumers, are looking for valuable connections with companies that provide outstanding products. For qualified advertisers, the IEEE Boston Section advertising options are very flexible. Through our affiliate, we will even help you design, develop, and host your ads for maximum efficiency. A few important features of the IEEE Boston Section

IEEE Boston Section is the largest, most active, and technically diverse section in the U.S. Comprised of Engineers, scientists and professionals in the electrical and computer sciences and engineering industry

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Contact IEEE Boston Section at ieeebostonsection@gmail.com for more information on rates for Online Advertising

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 diverse 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.

IEEE ComSoc School

6G Communications and Wireless Technology

June 5-9, Boston, MA, USA

N Institute for the Wireless
Internet of Things
at Northeastern

The Program

The focus of this school series is next-generation communication and networking technologies for 6G wireless systems. Lectures will mainly focus on the key technological enablers and innovations at physical and network layers, including, but not limited to:

- Exploiting frequencies above 100 GHz.
- Network sensing.
- Open Radio Access Network (ORAN).
- Artificial intelligence-driven communication algorithms and protocols.

The program will also include discussions on breakthrough applications and services for 6G, such as the Metaverse, ubiquitous Extended Reality (XR), and intelligent connected robotics.

As 6G is expected not to be the last generation of wireless systems to appear, the last day of the school will be focused on presenting trending research topics, still at the early stages of exploration.

Program Topics

- 6G is behind the corner
- 6G physical layer essentials
- 6G network layer essentials
- 6G beyond transmitting bits
- 6G is not the end! What's next

Applications Open until March 27th, 2023

- **This is an in-person event only, open to IEEE Com-Soc Student Members.**
- **Membership is not required to apply**, but if the application is accepted, the applicant needs to join the IEEE Communications Society.
- **Travel grants will be available** to (at least partially) help support travel expenses for some participants.
- Lodging, meals and refreshments will be **provided** to students during the event **free of charge**.
- **There is no registration fee** to attend this event.

Apply Now

Experiential Facilities

The participants will be introduced to the use of some of the top experiential facilities at the Institute for the Wireless Internet of Things.



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Python Applications for Digital Design and Signal Processing

Dates & Times: Live Workshops: 6:00 - 7:30PM EDT; Thursdays, April 6, 13, 20, 27
First Video Release, March 30, 2023, additional videos released weekly in advance of that week's live session!

Speaker: Dan Boschen

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

Location: Zoom

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.

Course Information will be distributed on Thursday, March 30, 2023 in advance of and in preparation for the first live workshop session.

Attendees will have access to the recorded session and exercises for two months (until June 27, 2023) after the last live session ends!

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

Topics / Schedule:

Pre-recorded lectures (3 hours each) will be distributed Friday prior to each week's workshop dates. Workshop/ Q&A Sessions are 6 - 7pm on the dates listed below:

Class 1

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

Class 2

Topic 2: Core Python constructs; iterators, functions, reading writing data files.

Class 3

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

Class 4

Topic 4: Bit/cycle accurate modelling and analysis using the design examples and simulation packages

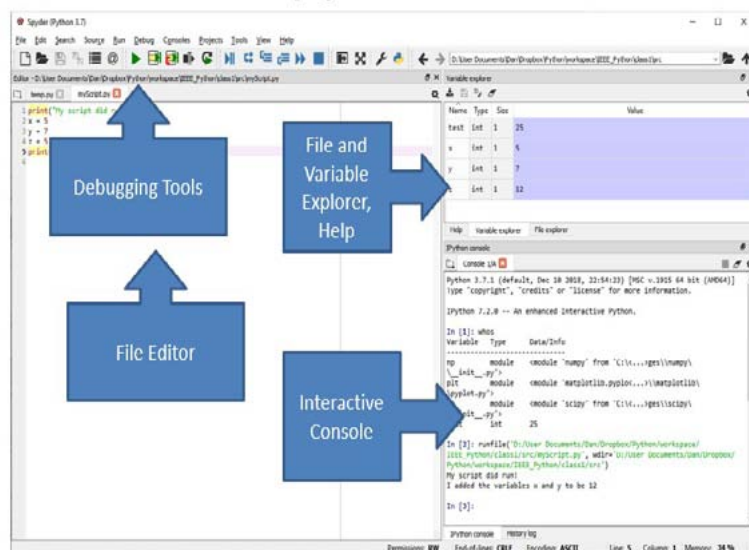
Speaker's Bio: Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing 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/>)

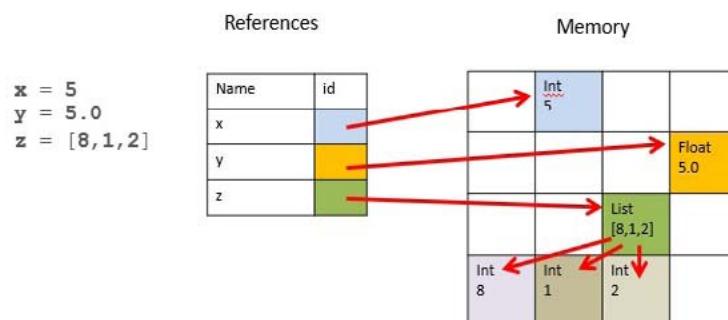
Decision (Run/Cancel) Date for this Course is Friday, March 24, 2023

Payment	On/by March 20	After March 20
IEEE Members	\$180	\$195
Non-members	\$195	\$215

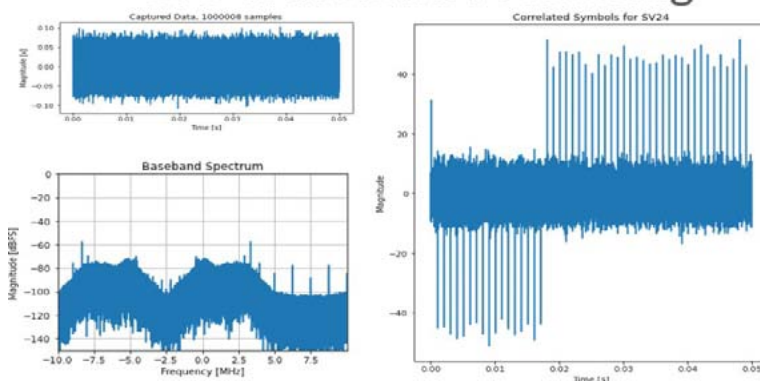
Spyder IDE



Mutable / Immutable



GPS Waveform Processing



https://ieeeboston.org/event/pythonapplications/?instance_id=3380

DSP for Wireless Communications

Dates & Times: Live Workshops: 6:00 - 7:30PM ET, Thursdays, July 27, August 3, 10, 17, 24
 First Video Release, July 20, 2023, (Orientation) 6:00 - 6:30PM
 Additional videos released weekly in advance of that week's live session

Speaker: Dan Boschen

Location: Zoom Webinar

New Format Combining Live Workshops with Pre-recorded Video - This is a hands-on course providing pre-recorded lectures that students can watch **on their own schedule** and an **unlimited number of times** prior to live Q&A/Workshop sessions with the instructor. Ten 1.5 hour videos released 2 per week while the course is in session will be available for up to two months after the conclusion of the course...until October 24, 2023.

Course Summary

This course is a fresh view of the fundamental and practical concepts of digital signal processing applicable to the design of mixed signal design with A/D conversion, digital filters, operations with the FFT, and multi-rate signal processing. This course will build an intuitive understanding of the underlying mathematics through the use of graphics, visual demonstrations, and applications in GPS and mixed signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges in both the analog and digital domains, and not a tutorial on working with specific DSP processor hardware.

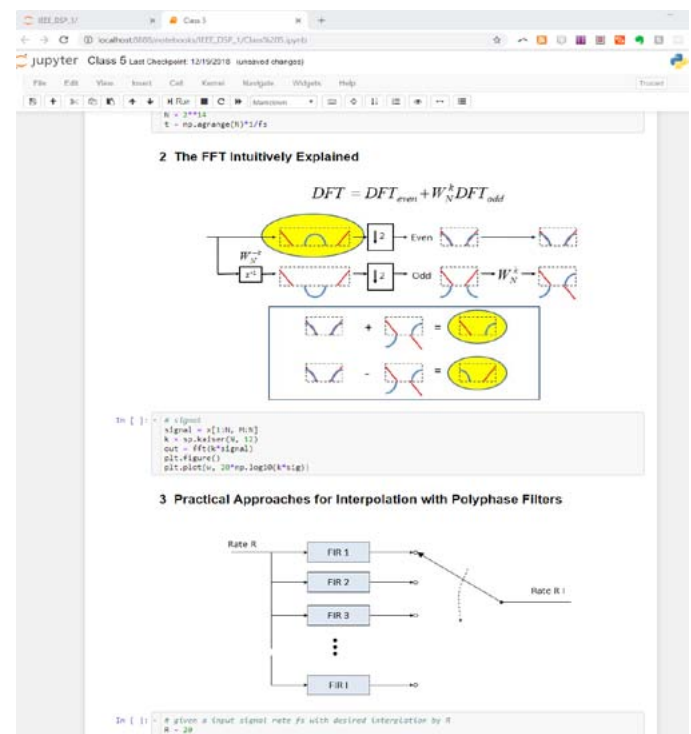
Now with Jupyter Notebooks!

This long-running IEEE Course has been updated to include Jupyter Notebooks which incorporates graphics together with Python simulation code to provide a "take-it-with-you" interactive user experience. No knowledge of Python is required but the notebooks will provide a basic framework for proceeding with further signal processing development using that tools for those that have interest in doing so.

This course will not be teaching Python, but using it for demonstration. A more detailed course on Python itself

is covered in a separate IEEE Course "Python Applications for Digital Design and Signal Processing".

Students will be encouraged but not required to load all the Python tools needed, and all set-up information for installation will be provided prior to the start of class.



Target Audience:

All engineers involved in or interested in signal processing applications. Engineers with significant experience with DSP will also appreciate this opportunity for an in-depth review of the fundamental DSP concepts from a different perspective than that given in a traditional introductory DSP course.

Benefits of Attending/ Goals of Course:

Attendees will build a stronger intuitive understanding of the fundamental signal processing concepts involved with digital filtering and mixed signal analog and digital design. With this, attendees will be able to implement more creative and efficient signal processing architectures in both the analog and digital domains. The knowledge gained from this course will have immediate practical value for any work in the signal processing field.

Topics / Schedule:

Class 1: Correlation, Fourier Transform, Laplace Transform

Class 2: Sampling and A/D Conversion, Z –transform, D/A Conversion

Class 3: IIR and FIR Digital filters, Direct Fourier Transform

Class 4: Windowing, Digital Filter Design, Fixed Point vs Floating Point

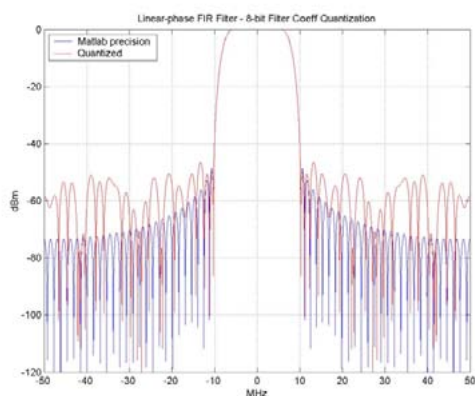
Class 5: Fast Fourier Transform, Multi-rate Signal Processing, Multi-rate Filters

Speaker's Bio:

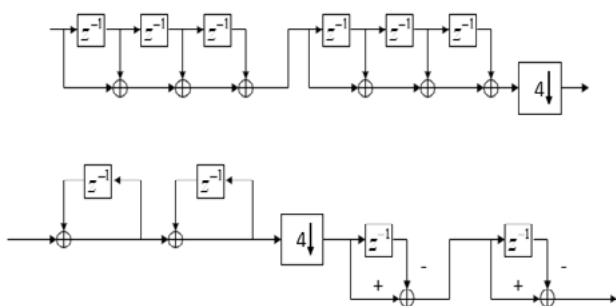
Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing and developing transceiver hardware from baseband to antenna for wireless communications systems. Dan 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 at: <http://www.linkedin.com/in/dan-boschen>

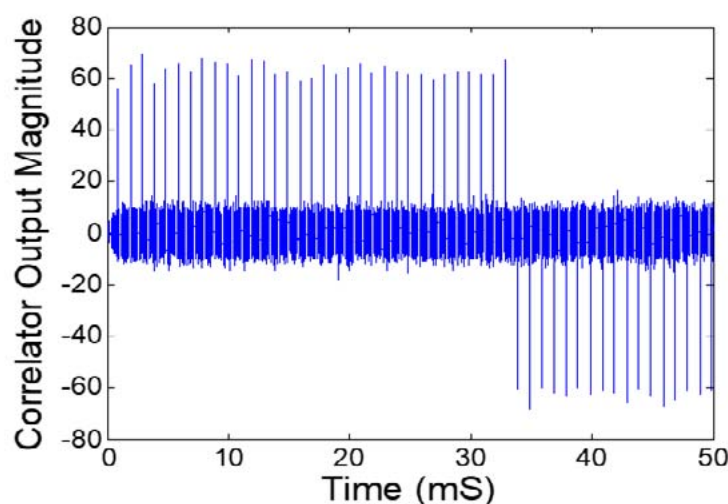
Linear Phase FIR Filter
(8-bit quantized filter coefficients)



Multi-stage CIC



Sliding Correlation



**Decision (Run/Cancel) Date for this Course is
Monday, July 17, 2023**

IEEE Members	\$190
Non-members	\$210

Digital Signal Processing (DSP) for Software Radio

Dates & Times: Live Workshops: 6 - 7:30PM EST; Thursdays, October 19, 26, November 2, 9, 16
First Video Release and orientation, 6 - 6:30PM October 12, 2023
Additional videos released weekly in advance of that week's live session!

Speaker: Dan Boschen

Location: Zoom

Attendees will have access to the recorded session and exercises for two months (until January 16, 2024) after the last live session ends!

This is a hands-on course providing pre-recorded lectures that students can watch on their own schedule and an unlimited number of times prior to live Q&A/Workshop sessions with the instructor. Ten 1.5 hour videos released 2 per week while the course is in session will be available for up to two months after the conclusion of the course.

Course Summary This course builds on the IEEE course "DSP for Wireless Communications" also taught by Dan Boschen, further detailing digital signal processing most applicable to practical real-world problems and applications in radio communication systems. Students need not have taken the prior course if they are familiar with fundamental DSP concepts such as the Laplace and Z transform and basic digital filter design principles.

This course brings together core DSP concepts to address signal processing challenges encountered in radios and modems for modern wireless communications. Specific areas covered include carrier and timing recovery, equalization, automatic gain control, and considerations to mitigate the effects of RF and channel distortions such as multipath, phase noise and amplitude/phase offsets.

Dan builds an intuitive understanding of the underlying mathematics through the use of graphics, visual demonstrations, and real-world applications for mixed

signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges, rather than a tutorial on implementations with DSP processors.

Now with Jupyter Notebooks! This long-running IEEE Course has been updated to include Jupyter Notebooks which incorporates graphics together with Python simulation code to provide a "take-it-with-you" interactive user experience. No knowledge of Python is required but the notebooks will provide a basic framework for proceeding with further signal processing development using that tools for those that have interest in doing so.

This course will not be teaching Python, but using it for demonstration. A more detailed course on Python itself is covered in a separate IEEE Course routinely taught by Dan titled "Python Applications for Digital Design and Signal Processing".

All set-up information for installation of all tools used will be provided prior to the start of class.

Target Audience: All engineers involved in or interested in signal processing for wireless communications. Students should have either taken the earlier course "DSP for Wireless Communications" or have been sufficiently exposed to basic signal processing concepts such as Fourier, Laplace, and Z-transforms, Digital filter (FIR/IIR) structures, and representation of complex digital and analog signals in the time and frequency do-

if you are uncertain about your background or if you would like more information on the course.

Benefits of Attending/ Goals of Course:

Attendees will gain a strong intuitive understanding of the practical and common signal processing implementations found in modern radio and modem architectures and be able to apply these concepts directly to communications system design.

Topics / Schedule:

Class 1: DSP Review, Radio Architectures, Digital Mapping, Pulse Shaping, Eye Diagrams

Class 2: ADC Receiver, CORDIC Rotator, Digital Down Converters, Numerically Controlled Oscillators

Class 3: Digital Control Loops; Output Power Control, Automatic Gain Control

Class 4: Digital Control Loops; Carrier and Timing Recovery, Sigma Delta Converters

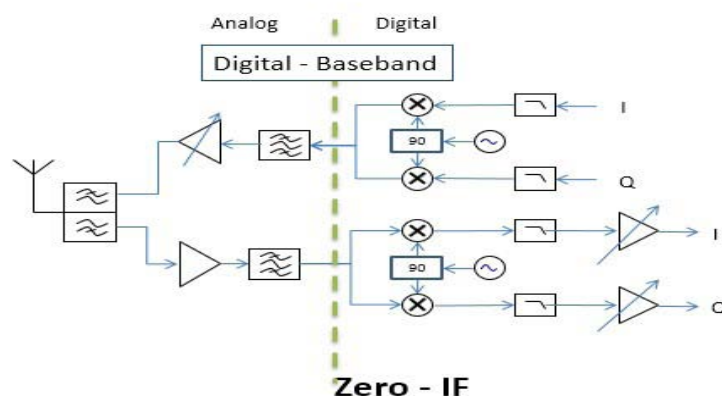
Class 5: RF Signal Impairments, Equalization and Compensation, Linear Feedback Shift Registers

Speaker's Bio:

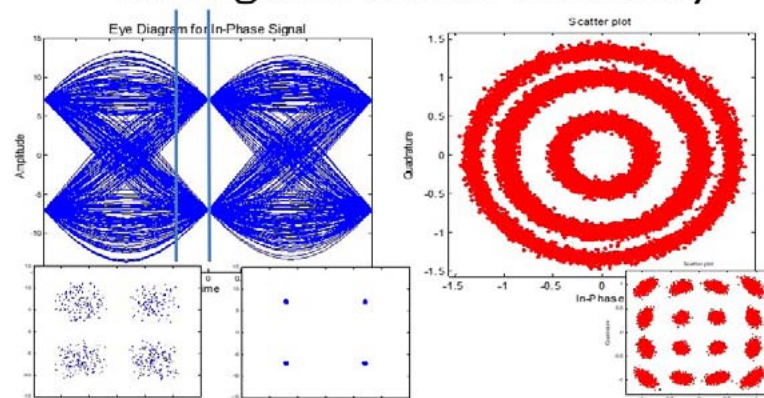
Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing and developing 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.

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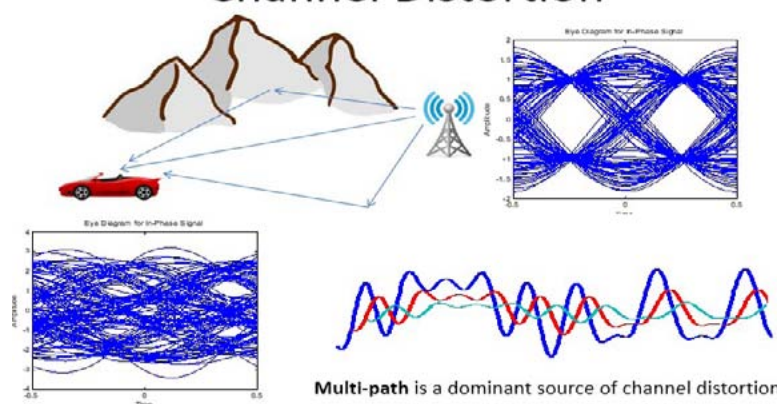
Radio Architectures



Timing and Carrier Recovery



Channel Distortion



**Decision (Run/Cancel) Date for this Course is
Monday, October 9, 2023**

IEEE Members	\$190
Non-members	\$210

https://ieeeboston.org/event/dpswradio/?instance_id=3429

Mark Your Calendar!



Every Wednesday in October 2023

4 Focused Tracks With Free Seminars

Oct. 4
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Integrity

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5G/Wi-Fi/
IoT

Oct. 18
PCB/
Interconnect/
EMC-EMI

Oct. 25
Radar/
Automotive/
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