

BOSTON



ENTREPRENEURS'
NETWORK
WEBINAR MEETINGS

P.6

PROF. DEV. TRAINING:
S/W DEVELOPMENT FOR MEDICAL
DEVICE MANUFACTURERS
(LIVE ONLINE COURSE)

P.17

PROF. DEV. TRAINING:
LATEST INSIGHTS IN RF AMPLIFIER
DESIGN: FUNDAMENTALS AND
APPLICATIONS

P.19

THE REFLECTOR

ISSUE #4
APRIL 2020

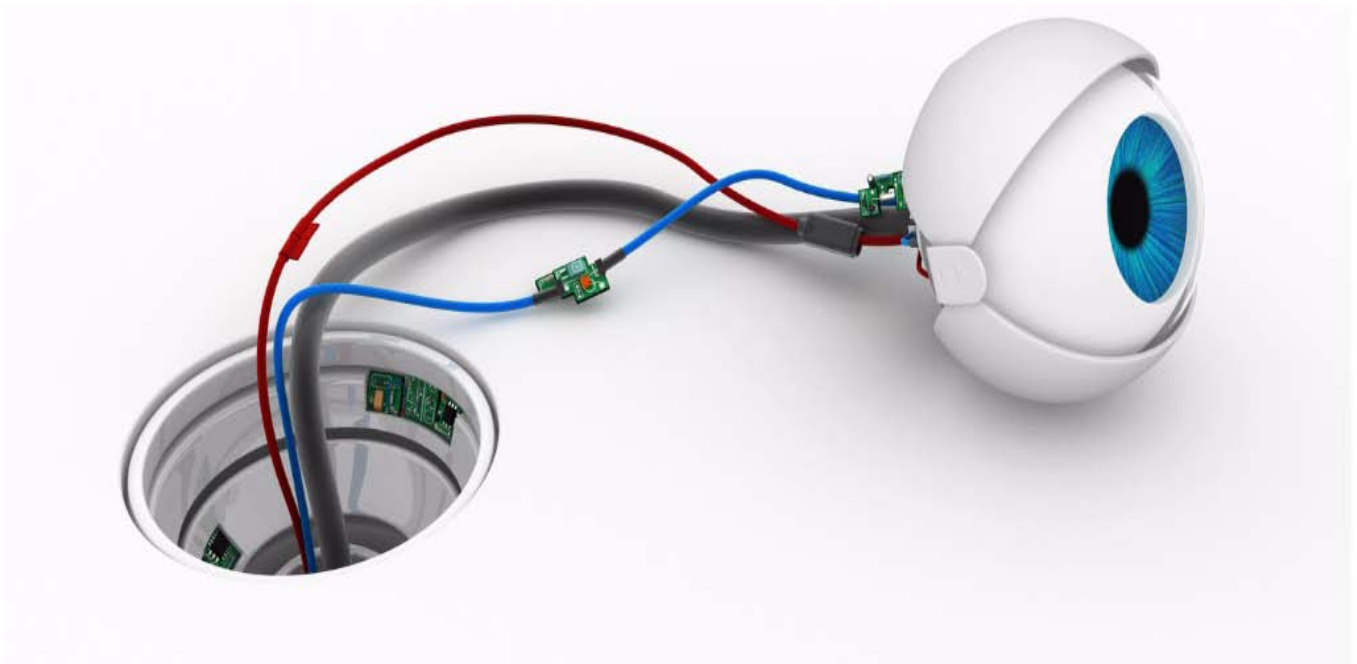


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Covid-19 Announcement

Please know that our thoughts are with those affected by the COVID-19 outbreak. The health and safety of our members and participants are our first priority. We are closely monitoring any specific advisories through official channels, which include the World Health Organization (WHO) and US Centers for Disease Control and Prevention (CDC).

Before attending any IEEE event, we recommend that you stay informed of any information local health agencies may make available and take reasonable precautions to protect yourself and others. IEEE continues to closely monitor this dynamic situation and will provide updates with any developments.

The following proactive steps are being taken to maintain a safe and healthy environment at the Boston Section IEEE activities

We are committed to following regional jurisdiction guidelines and rules in maintaining a safe environment for our attendees. See the CDC guidelines <https://www.cdc.gov/coronavirus/2019-nCoV/index.html>

Lastly, facilities in and around the Boston area are postponing outside events, such as IEEE chapter meetings. Many will be postponed until the fall. Our onsite courses have been postponed for the spring as well. We will continue to offer our online courses. See the listing at www.ieeeboston.org.

Please keep updated on our website as well as this Digital newsletter, and the e-reflector email notification.

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

IEEE Boston Section Online Courses:

(Students have 90 day access to all online, self-paced courses)

Verilog101:Verilog Foundations

Full course description and registration at ,
<http://ieeeeboston.org/verilog-101-verilog-foundations-online-course/>

System Verilog 101: Design Constructs

Full course description and registration at ,
<http://ieeeeboston.org/systemverilog-101-sv101-design-constructs-online-course/>

System Verilog 102: Verification Constructs

Full course description and registration at ,
<http://ieeeeboston.org/systemverilog-102-sv102-verification-constructs-online-course/>

High Performance Project Management

Full course description and registration at ,
<http://ieeeeboston.org/high-performance-project-management-online-course/>

Introduction to Embedded Linux Part I

Full course description and registration at ,
<http://ieeeeboston.org/introduction-to-embedded-linux-part-i-el201-online-course/>

Embedded Linux Optimization - Tools and Techniques

Full course description and registration at ,
<http://ieeeeboston.org/embedded-linux-optimization-tools-techniques-line-course/>

Embedded Linux Board Support Packages and Device Drivers

Full course description and registration at ,
<http://ieeeeboston.org/embedded-linux-bsps-device-drivers-line-course/>

Software Development for Medical Device Manufacturers

Full course description and registration at ,
<http://ieeeeboston.org/software-development-medical-device-manufacturers-line-course/>

Fundamental Mathematics Concepts Relating to Electromagnetics

Full course description and registration at ,
<http://ieeeeboston.org/fundamental-mathematics-concepts-relating-electromagnetics-line-course/>

Reliability Engineering for the Business World

Full course description and registration at ,
<http://ieeeeboston.org/reliability-engineering-business-world-line-course/>

Design Thinking for Today's Technical Work

<http://ieeeeboston.org/design-thinking-technical-work-line-course/>

Fundamentals of Real-Time Operating Systems

<http://ieeeeboston.org/fundamentals-of-real-time-operating-systems-rt201-on-line-course/>

April Chapter Meeting Summary

Entrepreneurs' Network – 7:00 - 8:30PM, Tuesday, April 7

Product Development in Life Science and High-Tech Start Ups

Location: Webinar

Entrepreneurs' today don't need to build a manufacturing plant to start a business. They need less money to build prototypes, prove that it works, prove there is a market and show a potentially profitable business model before scaling. The road maps have changed but the core has stayed the same. Why will your customers buy it?

Whether you want to sell a new kind of transportation system, a new app or a life saving device, you've got to develop your idea into a product that customers are willing to pay for. Do you try to develop the product in house, or do you outsource the development? How do you fund your product development? How do you make sure you're developing the right product for your market? [See Page 6](#)

Entrepreneurs' Network – 7:00 - 8:30PM, Tuesday, April 21

Planning for the Regulatory Environment of your Life Sciences Startup

Location: Webinar

Start-ups are hard work. Launching a start-up is difficult, time consuming and fraught with challenges and risks. Operating an emerging company to achieve financial success is also difficult and risky, with untold obstacles to success in product R&D, financing, operations, business development...and the list goes on. If the day to day challenges of entrepreneurship seem daunting, life sciences entrepreneurs often have another (not so small) detail to contend with. Regulatory approval, through government agencies like the U.S. FDA and the EU's EMA, may be required before a product reaches the market – requiring rigorous (and expensive) clinical trials and highly regulated manufacturing processes, among other details. [See Page 8](#)

Advertise with us!!!

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

IEEE Boston Section Rate Card

<http://ieeeboston.org/advertise-ieee-boston-section/>

IEEE Boston Media Kit

<http://ieeeboston.org/advertise-ieee-boston-section/>

Contact Kevin Flavin or 978-733-0003 for more information on rates for Print and Online Advertising

Entrepreneurs' Network – 7:00 - 8:30PM, Tuesday, April 7

Product Development in Life Science and High-Tech Start Ups

Location: Webinar

Register at

<https://boston-enet.org/event-3461323/Registration>

Entrepreneurs' today don't need to build a manufacturing plant to start a business. They need less money to build prototypes, prove that it works, prove there is a market and show a potentially profitable business model before scaling. The road maps have changed but the core has stayed the same. Why will your customers buy it?

Whether you want to sell a new kind of transportation system, a new app or a life saving device, you've got to develop your idea into a product that customers are willing to pay for.

Do you try to develop the product in house, or do you outsource the development?

How do you fund your product development?

How do you make sure you're developing the right product for your market?

The panelists have deep experience in developing and investing in different types of products in life sciences and high-tech. Our discussion will offer guidance in matching your product to your market and practical suggestions for making the most of your development budget. Listen to our speakers share a few stories from their own product development adventures and effective advice for avoiding product development pitfalls.

Agenda:

7:00 - 7:15 PM - ENET Chairperson's announcements

7:15 - 7:30 PM - eMinute - Up to 3 Startup companies' presentations

7:30 - 8:15 PM - 2 expert speakers on the night's topic

A question and answer session follow the presentation, and panelists will be available afterward for responses to individual questions.

Panelists:



Joyce C. Chiu, PMP, CPIP, has 20+ years of experience leading large complex new product development under rigorous stage gate processes

She has successfully taken products from initial R&D or design phase, through VOC (voice of customer), CTQ (critical to quality), PQA (product quality architecture), Requirements, Prototyping, Engineering, V&V (Verification & Validation), UAT (user acceptance testing) to global launch, utilizing best practices from PMP and Agile/Scrum, to achieve both "do it right the first time" and "do it fast". Two of the products she provided leadership for earned independent industry awards the year after launch.

Joyce will share the wealth and breadth of her product development experience in both the physical and the virtual worlds. Her process development and program management experience spans specialty chemicals, single-use Bioprocess disposables, PPE (personal protection equipment), life sciences in both medical devices and biotechnology. Most recently, she took on R&D IT projects serving Biopharma pre-clinical manufacturing and process development. Joyce is a BS Chemical Engineer from Cornell University and an MBA from Babson College. She has been active in greater Boston area professional organizations, including MDG and ISPE Boston Area Chapter. As a CPIP she has served the latter in a variety of roles, including Industry Advisory Board and Program Manager for the 2019 Product Show Education Seminars
<https://www.linkedin.com/in/joycechiu/>

Harry Martins - Senior Manager, New Product Development at Bridgemedica - A Service of NN Life Sciences

A product development leader with 25 years of medical device experience, he currently leads the New Product



Development team at Bridgemedica with a focus on mechanical and electro-mechanical single-patient disposable medical devices. Harry has developed products in the areas of orthopedics, biologics for neural and ocular surgery, vascular access, drug delivery, and pulmonary and endoscopic surgery while at Depuy Mitek/J&J, Cytotherapeutics, Biolink, Control Delivery Systems, Boston Scientific and Tissue Regeneration, Inc. During his

8+ years at Bridgemedica, he has brought in or worked directly on products relating to female sterilization, laparoscopic hysterectomy, tissue morcellation, laparoscopic vessel ligation, targeted brain infusion, protein purification, spinal taps, tumor ablation, varicose vein sclerotherapy, lipoplasty, and fat grafting, laparoscopic imaging, and embolic delivery. Harry holds or contributed to 28 issued U.S. Patents with 25 pending applications. He has a BS in Mechanical Engineering from the University of Massachusetts, a MS in Mechanical Engineering from Stanford University, and a MS in Bioengineering from the University of Michigan. <https://www.linkedin.com/in/harrymartins/>

Organizer and Moderator:



Dan Skiba, President & CEO GOT Interface; 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/>

Register: Please register at

<https://boston-enet.org/event-3461323/Registration>

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.

Entrepreneurs' Network – 7:00 - 8:30PM, Tuesday, April 21

Planning for the Regulatory Environment of your Life Sciences Startup

Location: Webinar

Register at

<https://boston-enet.org/event-3461324/Registration>

Start-ups are hard work. Launching a start-up is difficult, time consuming and fraught with challenges and risks. Operating an emerging company to achieve financial success is also difficult and risky, with untold obstacles to success in product R&D, financing, operations, business development...and the list goes on.

If the day to day challenges of entrepreneurship seem daunting, life sciences entrepreneurs often have another (not so small) detail to contend with. Regulatory approval, through government agencies like the U.S. FDA and the EU's EMA, may be required before a product reaches the market – requiring rigorous (and expensive) clinical trials and highly regulated manufacturing processes, among other details.

ENET is here to help; we're all about offering practical insights, from experienced industry veterans, to help entrepreneurs to succeed. Tonight's panel will offer insights on how to prepare for meeting rigorous regulatory requirements and even when to get started thinking about regulatory affairs.

Agenda:

7:00 - 7:15 PM - ENET Chairperson's announcements
7:15 - 7:30 PM - eMinute - Up to 3 Startup companies' presentations

7:30 - 8:15 PM - 2 expert speakers on the night's topic
A question and answer session follow the presentations

Panel



Gail Radcliffe, President Radcliffe Consulting, Inc.

Gail E. Radcliffe has more than 20 years experience assisting medical device and diagnostics companies with technical assessment, market research and clinical/regulatory issues. Gail founded

Radcliffe Consulting in 1998 after having worked at GENE-TRAK, where she developed IVD assays for several infectious disease organisms including HIV, CMV, TB and Chlamydia and was responsible for instituting the clinical affairs group.

As a consultant, Gail has provided assistance to start-up and established medical device companies with market research, regulatory strategy (IVD vs. CLIA lab) and submissions, quality systems development and clinical trial support. Consulting engagements have encompassed a wide range of products including cutting edge digital pathology instruments, stem cell laser dissection devices, companion diagnostics, and multiplex molecular, NGS, POC and CLIA Waived in vitro diagnostic devices.

Gail obtained a Ph.D. in Molecular Biology from Brown University and completed a post-doctoral fellowship in molecular immunology at the University of Massachusetts Medical School.

She is a member of the Regulatory Affairs Professional Society (RAPS), American Society of Microbiology (ASM) and Sigma Xi. She is on the Board of Trustees of the Massachusetts Biomedical Initiatives and acts as an advisor to venture capital companies.

<https://www.linkedin.com/in/gail-radcliffe-13a0891/>



Kevin J. Slatkavitz, President and Founder, ThinkQuality, LLC

Kevin is President/Founder of ThinkQuality, LLC – a strategic consulting firm providing clients across the life sciences with practical customized strategies, solutions and coaching to address a range of quality and regulatory compliance challenges and opportunities from

early stage discovery through critical development milestones to product approval/launch and beyond.

He has over 30 years of real world, boots-on-the-ground experience/insights into the complex and global

rigors of small and large organizations and draws on over 10 regulatory product approvals (from Lipitor® to Linzess®) and many more investigational and commercial products from numerous therapeutic categories and delivery systems.

What differentiates Kevin is his “fit-first-time” approach to integrating quality and regulatory compliance proactively and strategically with the science/technology into a client’s business plan as a means to demonstrate value to investors, regulators, patients and other key stakeholders.

Kevin serves as a MassBio/MassConnect mentor for start-up companies.

<https://www.linkedin.com/in/kevinslatkavitz/>



PRAVIN R. CHATURVEDI, CEO and Co-Founder, Oceanyx Pharmaceuticals. Pravin Chaturvedi is an experienced drug developer and a seasoned biotech entrepreneur. He is the Chairman of the Scientific Advisory Board for Napo Pharmaceuticals/Jaguar Health. He is the CEO of IndUS Pharmaceuticals and Oceanyx Pharmaceuticals. He is the

Chairman of the Board of Cellanyx and also serves on the boards of IndUS, Oceanyx, ResoluteBio, Enlivity, MAG Optics, FuelEd Schools and Sindu Research Laboratories. He has previously served as the President and CEO of Pivot Pharmaceuticals and Scion Pharmaceuticals, and served on the boards of Pivot, Scion, Bach Pharma, PRADAN USA, Sindu Pharmaceuticals and TiE Boston. He was the Head of Lead Evaluation at Vertex Pharmaceuticals; and previously was at Alkermes and Parke-Davis/Warner-Lambert (now Pfizer). He has participated in the successful drug approval and commercialization of seven drugs indicated for the treatment of CNS, viral and gastrointestinal disorders.

He is as an adjunct faculty member at Georgetown Medical School. <https://www.linkedin.com/in/pravin-chaturvedi-a329392/>

Moderator/Meeting Organizer

Roger Frechette, Life Science Business Executive / Entrepreneur / Mentor – NEPAAssociates, LLC



My daily purpose is to exercise an innate drive to transform ideas and projects into life-changing commercial assets. In the life science business, this is the long game, requiring boundless energy and creativity, coupled with knowledge, experience, and patience.

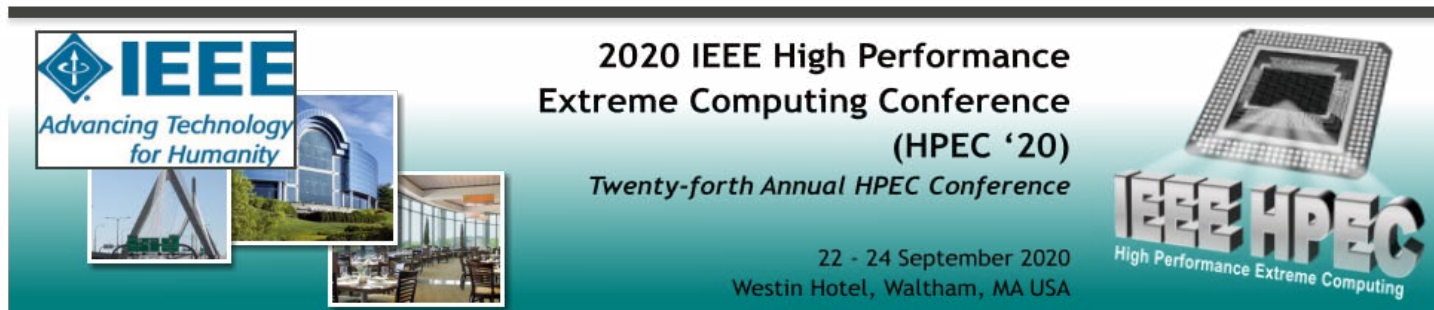
In my consulting work, I help clients as a business adviser or on-demand, fractional executive. I leverage an extensive global network and insights derived from >20 years of experience in business development, calibrated with an extensive science background. My career has encompassed success as a business executive, project and strategic alliance manager, entrepreneur, and also as a scientist, including leadership of discovery/preclinical development teams resulting in successful drug candidates NUZYRA (omadacycline) and SEYSARA (sarecycline), FDA approved Oct 2018. <https://www.linkedin.com/in/rogerfrechette/>

eMinute PITCH Presentations will be given at the start of each meeting. These 90-second elevator-style presentations enable early-stage startup entrepreneurs to gain experience in presenting a summary of their business plans to expert panels and audiences.

Register: Please register at

<https://boston-enet.org/event-3461324/Registration>

CALL FOR PAPERS



2020 IEEE High Performance Extreme Computing Conference (HPEC '20)
Twenty-fourth Annual HPEC Conference

22 - 24 September 2020
 Westin Hotel, Waltham, MA USA

www.ieee-hpec.org

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 ASDR&E

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Administrative Contact
 Mr. Robert Alongi
 IEEE Boston Section

A note from the HPEC Committee:

We all hope that by Fall of 2020 normal conference participation will have resumed. If that is not the case, IEEE HPEC will have virtual conference options that will allow safe participation and full publication in IEEE Xplore.

The IEEE High Performance Extreme Computing Conference (HPEC '20) will be held in the Greater Boston Area, Massachusetts, USA on 22 – 24 September 2020. 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: **May 22, 2020**
 Notification of Acceptance: **July 1, 2020**
 Camera Ready Deadline: **August 31, 2020**

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 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.

DSP for Software Radio

(13 hours of instruction!)

Time & Date: Postponed until Fall 2020, Exact dates TBD

Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA

Speaker: Dan Boschen

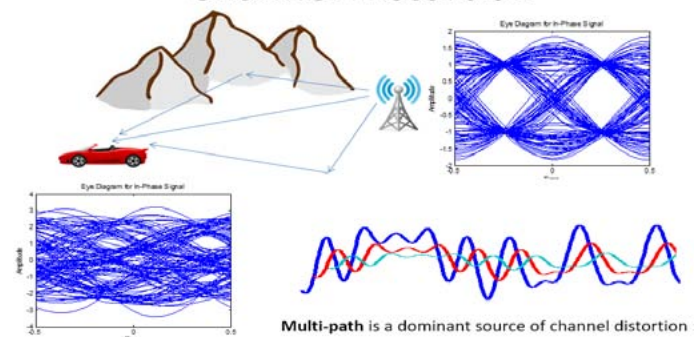
Course Summary

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. The course title has been changed with some minor additions but this is the same course that was previously taught titled “More DSP for Wireless Communications”, with the addition of Python demonstrations using Jupyter Notebooks.

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

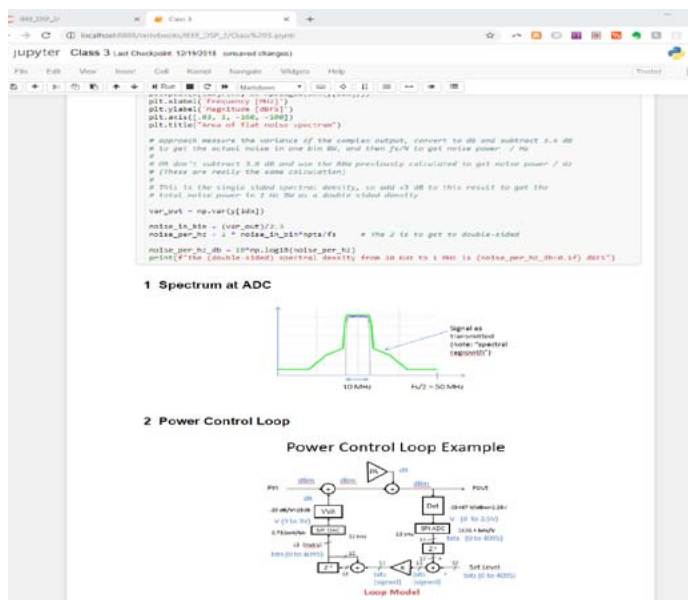
Channel Distortion



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!

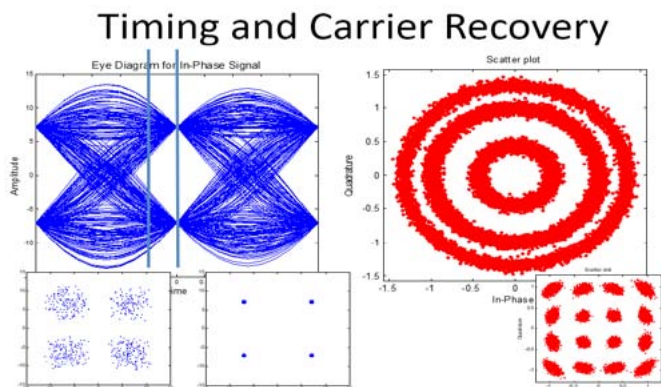
This long-running IEEE Course has been updated to include Jupyter Notebooks which incorporates graphics together with Python simulation code to provide a “take-it-with-you” interactive user experience. No knowledge of Python is required but the notebooks will provide a basic framework for proceeding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



This course brings together core DSP concepts to address signal processing challenges encountered in radios and modems for modern wireless communications.

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”.

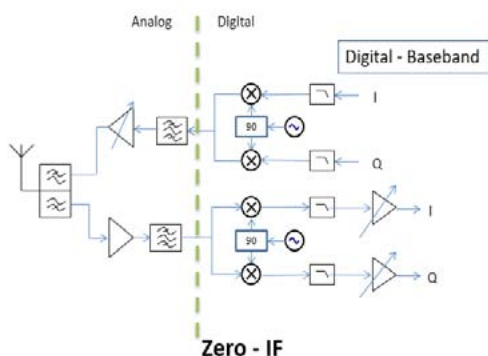
Students will be encouraged but not required to bring a laptop to class, and all set-up information for installation will be provided prior to the start of class.



Target Audience:

All engineers involved in or interested in signal processing 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 domains. Please contact Dan at boschen@loglin.com if you are uncertain about your background or if you would like more information on the course.

Radio Architectures



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. 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>

Decision (Run/Cancel) Date for this Courses is TBD

Payment received by TBD

IEEE Members \$340

Non-members \$375

Payment received after TBD

IEEE Members \$375

Non-members \$415

DSP for Wireless Communications

(13 hours of instruction!)

Time & Date: Postponed until Fall 2020, Exact dates TBD

Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA

Speaker: Dan Boschen

Course Summary:

This course is a fresh view of the fundamental 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”.

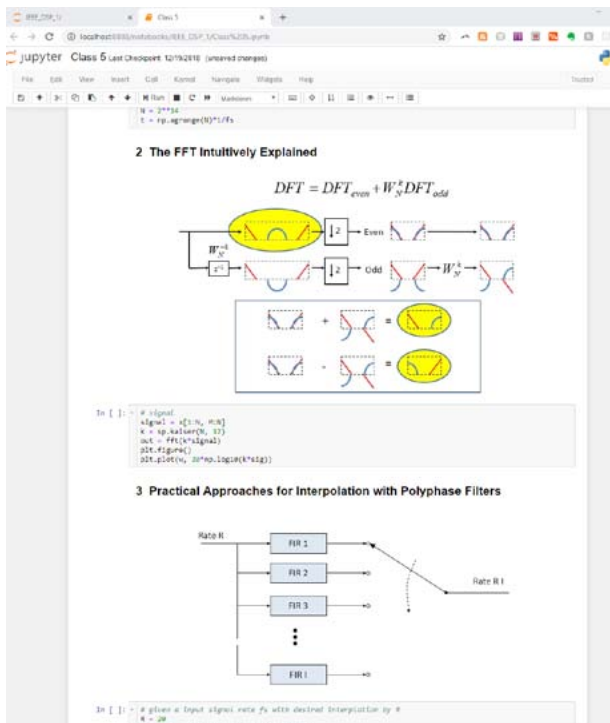
Students will be encouraged but not required to bring a laptop to class, and all set-up information for installation will be provided prior to the start of class.

Target Audience:

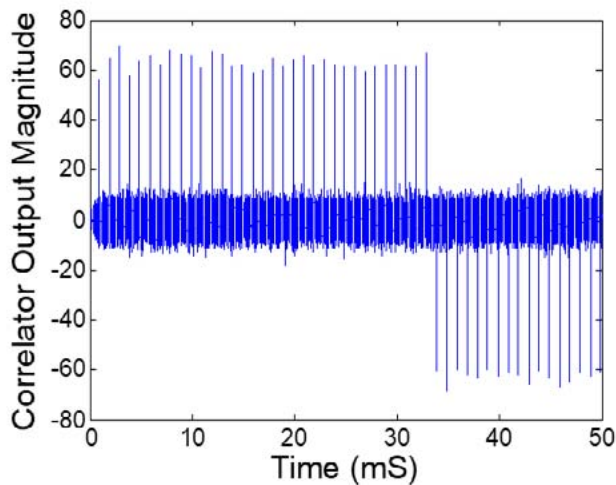
All engineers involved in or interested in signal processing applications. Engineers with significant experience with DSP will also appreciate this opportunity for an in-depth review of the fundamental DSP concepts from a different perspective than that given in a traditional introductory DSP course.

Benefits of Attending/ Goals of Course:

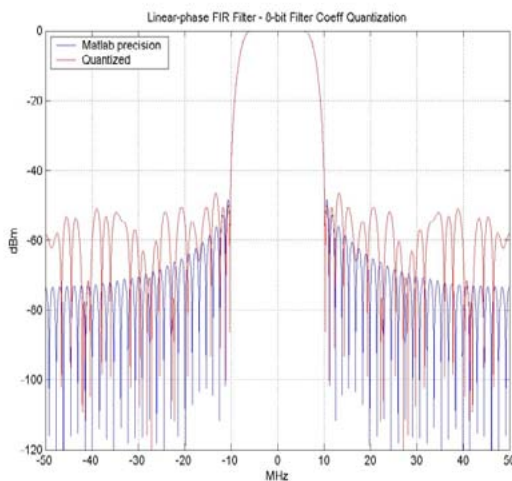
Attendees will build a stronger intuitive understanding of the fundamental signal processing concepts involved with digital filtering and mixed signal analog and digital design. With this, attendees will be able to implement more creative and efficient signal processing architectures in both the analog and digital domains.



Sliding Correlation



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



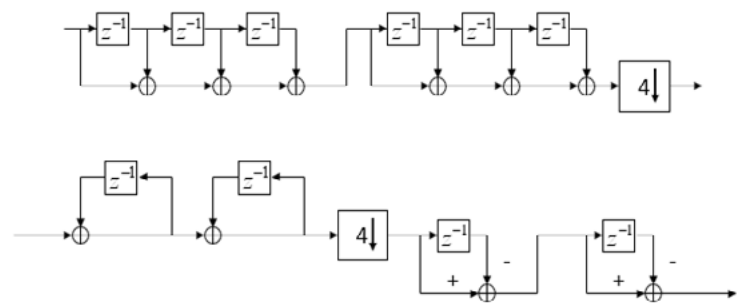
Class 4: Windowing, Digital Filter Design, Fixed Point vs Floating Point

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.

Multi-stage CIC



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

Decision (Run/Cancel) Date for this Courses is TBD

Payment received by TBD

IEEE Members \$350

Non-members \$385

Payment received after TBD

IEEE Members \$385

Non-members \$420

Python Applications for Digital Design and Signal Processing

(14.5 hours of instruction!)

Time & Date: Postponed until Fall 2020, Exact dates TBD
Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA
Speaker: Dan Boschen

Course Summary

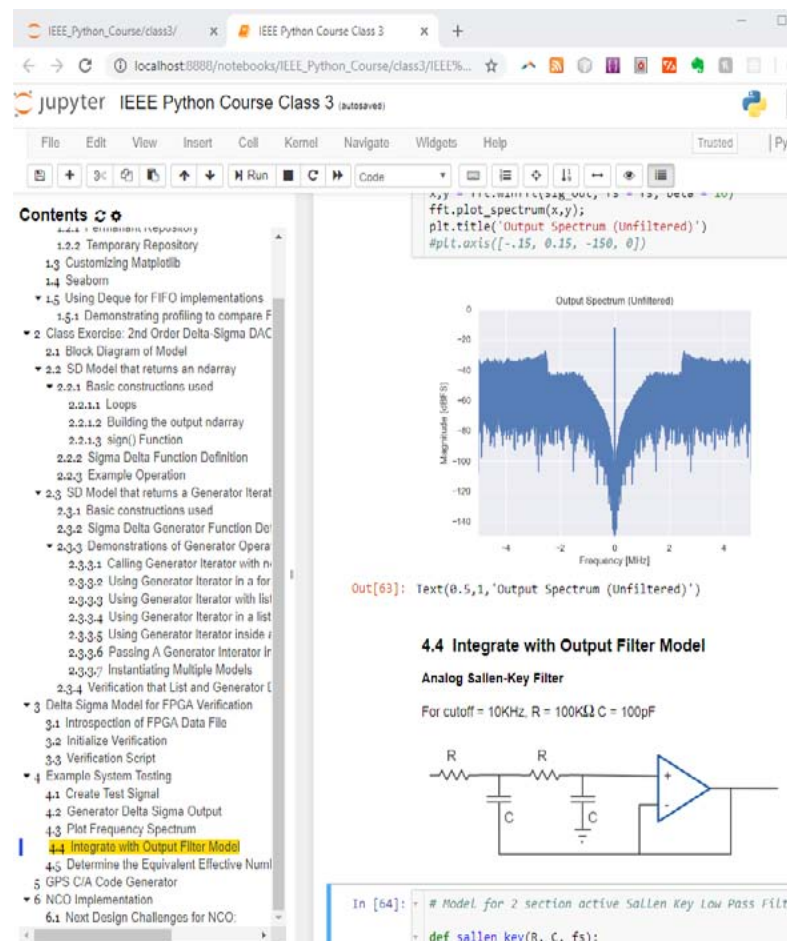
This is a bring-your-own laptop, hands-on course in the popular and powerful open source Python programming language.

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 solving signal processing challenges. Students will be using the Anaconda distribution, which combines Python with the most popular data science applications, and the 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.

Once a basic working knowledge of the language is established, 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.

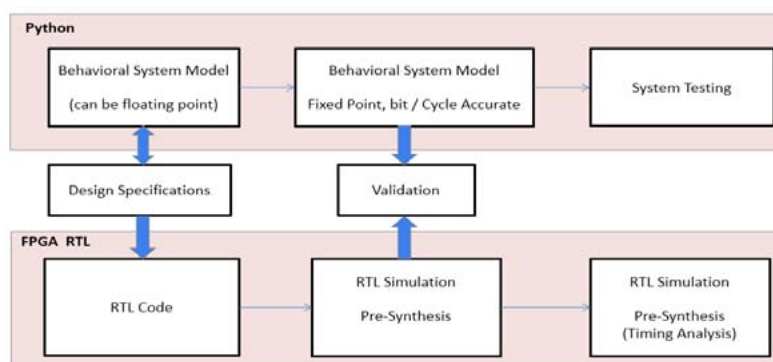


Target Audience: This course is targeted toward users with little to no prior experience in Python, however familiarity with other modern programming languages and an exposure to object-oriented constructs is very helpful. Students should be comfortable with basic signal processing concepts in the frequency and time domain. Familiarity in Matlab or Octave is not required, but the equivalent operations in Python using the NumPy package will be provided for those students that do use Matlab and/or Octave for signal processing applications.

A laptop (Mac or PC) preconfigured with Anaconda is required; the specific installation instructions will be emailed to students prior to the start of class.

Biography: 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 Symmettricom) leading design efforts for advanced frequency and time solutions.

Python for Verification



For more background information, please view Dan's Linked-In page.

Course Schedule and Topics

Thursday, March 19

8am-8:30am Registration/sign-in, coffee

8:30am-10am - Intro to Jupyter Notebooks, the Spyder IDE and the course design examples including Delta Sigma Converters, GPS Code Generators, and Numerically Controlled Oscillators. Core Python constructs.

15 minute break

10:15am-12:00 pm - Intro to Jupyter Notebooks, continued

45 minute lunch

12:45pm-2:45pm - Core Python constructs, functions, reading writing data files.

15 minute break

3:00pm-5:00pm Core Python constructs, functions, reading writing data files, continued.

Friday, March 20

8:30am-10am - Signal processing simulation with popular packages including NumPy, SciPy, and Matplotlib.

15 minute break

10:15am-12:00 pm Signal processing simulation with popular packages including NumPy, SciPy, and Matplotlib, continued.

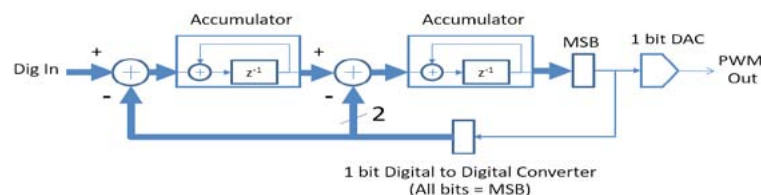
45 minute lunch

12:45pm-2:45pm - Bit/cycle accurate modelling and analysis using the design examples and simulation packages

15 minute break

3:00pm-5:00pm - Bit/cycle accurate modelling and analysis using the design examples and simulation packages, continued, Final questions.

2nd Order Delta Sigma DAC



notes, lunch and coffee breaks included with registration

Decision (Run/Cancel) Date for this Courses is TBD

Payment received by TBD

IEEE Members \$450

Non-members \$495

Payment received after TBD

IEEE Members \$495

Non-members \$535

<http://ieeeboston.org/%20python-for-signal-processing/>

Software Development for Medical Device Manufacturers

Web-based Course with live Instructor!

(12.5 hours of instruction!)

Times & Dates: 1:00 - 4:PM EDT; April 28, 30, May 5, 7

Speaker: Steve Rakitin

This course will be presented with a live instructor using web-meeting software. The course content will be covered in 4 sessions presented over four days.

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 MATERIAL

Course notes, access to an extensive collection of reference documents and a training certificate will be 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. Please note that duration of each session may slightly change depending on the number of questions posed to the instructor.

AGENDA

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:
 - o Guidance for Content of Pre-market Submissions for Medical Devices Containing Software
 - o Off-the-Shelf Software Use in Medical Devices
 - o General Principles of Software Validation
 - o Content of Premarket Submissions for Management of Cybersecurity in Medical Devices
 - o Policy for Software Device Functions and Mobile Medical Applications
 - o Applying Human Factors and Usability Engineering to Medical Devices
- International Standards:
 - o ISO 13485:2016 Medical Devices – Quality Management Systems

- o IEC 62304: 2015 Medical Device Software – Software Lifecycle Processes
- o ISO 14971: 2019 Application of Risk Management to Medical Devices
- o 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
- o How does Agile Development fit?
- o Medical Device Software Lifecycle Processes
- Risk Management
- o FDA Levels of Concern
- o IEC 62304 Software Safety Classification
- Software Requirements
- o 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
- o Technical Reviews
- o Static Analysis
- o 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

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

Course Cancellation and Refund Policy: Requests for online course cancellations must be received 3 business days prior to the course date for a full refund. Once course materials have been shared with a participant, a cancellation request cannot be accommodated.

About the instructor...

Steven R. Rakitin has over 40 years experience as a software engineer and software quality manager. He helped write the first IEEE Software Engineering Standard (IEEE-STD-730 Standard for Software Quality Assurance Plans) and worked on revisions to both IEEE Standard 1012-2012 (Software Verification & Validation) and IEEE 730-2014 (Software Quality Assurance). He has written several papers on software quality 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 the IEEE. As President of Software Quality Consulting, he helps medical device companies comply with FDA regulations, guidance documents, and international standards in an efficient and cost-effective manner.

Decision (Run/Cancel) Date for this Courses is Thursday, April 23

IEEE Members	\$285
Non-members	\$345

Latest Insights in RF Amplifier Design from World's Leading Experts – Fundamentals and Applications

(12 hours of instruction!)

Time & Date: 6 – 8PM, Tuesdays, September 29, October 6, 13, 20, 27, November 3

Location: MIT Lincoln Laboratory, 3 Forbes Road, Lexington, MA

Course summary/overview:

This six week lecture series is intended to give a broad overview of state-of-the-art RF PA techniques with practical aspects for working professionals together with students for future RF PA designers, from fundamentals to applications. It begins with a review of RF power amplifier concepts then teaches handset PA design techniques, issues and solutions faced with designing RF PAs for mobile applications. It also discusses high efficiency amplifier structures with different classes of operation, and other architectures. A high linearity techniques lecture with behavioral modelling will follow. GaAs/GaN MMIC level millimeter-wave amplifier design tutorials and techniques will be lectured including foundry/technology selection, loadpull, loadline analysis and simulations with EDA tools. Lastly, digital perspective transmitters will be presented using GaN technology together with FPGA and ASICs.

Benefits of attending:

This course will give a broad overview of state-of-the-art RF PA techniques with practical aspects to help sharpen current skill sets as well as initiate the RF PA design with better confidence.

Target Audience/who should attend:

RF engineer professionals and prospective RF amplifiers / RFIC design students

Outline

RF Amplifier Basics – (9/29/2020)

by Dr. Nestor Lopez at MIT Lincoln Laboratory

RF Power Amplifier Design for Mobile Applications – (10/06/2020) - by Dr. Douglas Teeter at Qorvo

Digital Transmitter – (10/13/2020)

by Dr. Rui Ma at Mitsubishi Electric Research Labs

High-Efficiency RF Power Amplifiers Architecture – (10/20/2020)

by Dr. Nestor Lopez at MIT Lincoln Laboratory

High Frequency RF Amplifiers MMIC Design with GaAs/GaN pHEMT with EDA tools - (10/27/2020)

by Dr. Youngho Suh at MIT Lincoln Laboratory

Behavioral Modeling and Linearization of RF Power Amplifiers – (11/03/2020)

by Dr. Kevin Chuang at NanoSemi, Inc.

Decision (Run/Cancel) Date for this Courses is Monday, September 21

Payment received by Sept. 15

IEEE Members	\$195
Non-members	\$235
Full Time Students	\$75

Payment received after Sept. 15

IEEE Members	\$235
Non-members	\$255
Full Time Students	\$100

http://ieeeboston.org/event/latest-insights-in-rf-amplifier-design/?instance_id=2845



**Mark
Your
Calendar!**



Returning Tuesdays in October

4 FOCUSED TRACKS WITH FREE SEMINARS IN:

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October 6, 13, 20, & 27

WWW.EDICONONLINE.COM