BOSTON

THE REFLECTOR

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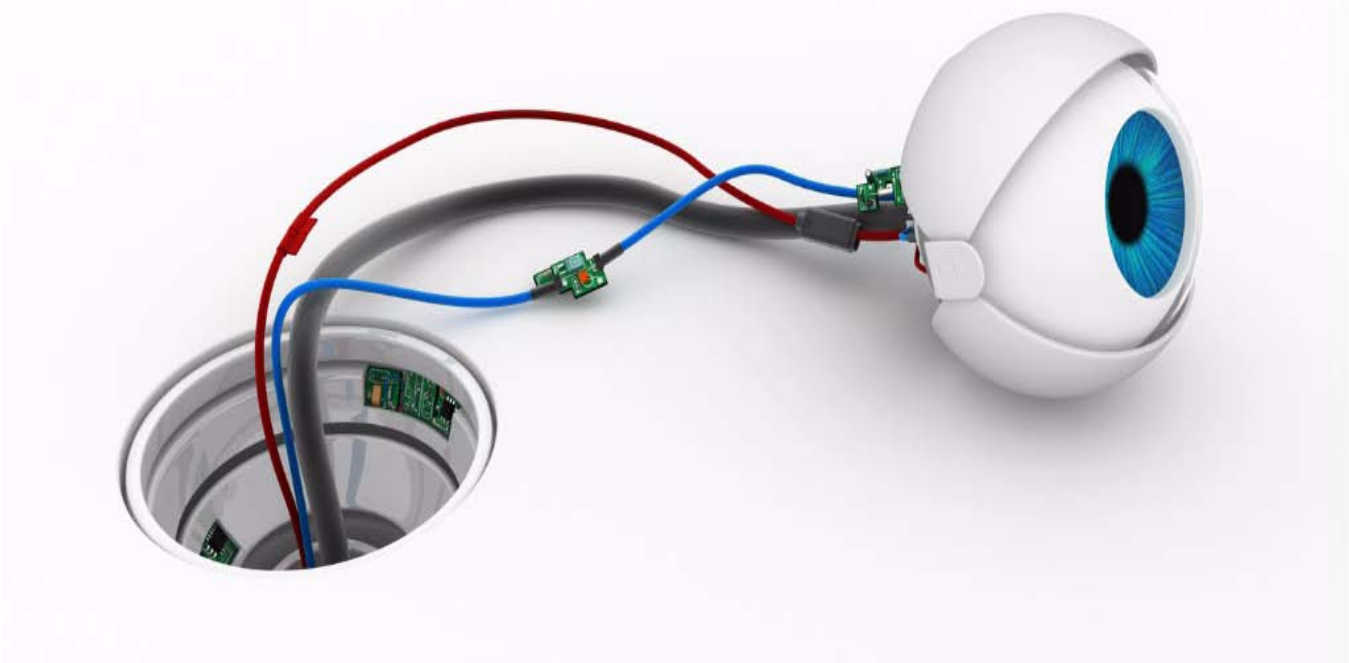

IEEE
Advancing Technology for Humanity

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It's all Clear as 20/20!

by Kevin Flavin, IEEE Boston Section,
Electronics Communications, Chair

As I sat down to right this month's editorial, I stumbled across this little statistic and I wanted to share with you because, frankly, I'm stunned: Apple shareholders enjoyed a 102% return for 2019, and we thought the iPhone X – with incremental new features – was going to be a flop. Maybe the experts aren't always right.

As a quick update, this month, January, I joined a local manufacturer, Boston Micromachines. We build micro electro-mechanical systems for adaptive optics – so we can see exoplanets in other solar systems and other very cool things! I guess after 30 years, I'm leaving financial engineering to return to regular engineering – and I couldn't be happier!

I was catching up on my podcasts, and even though I don't spend my days in fintech and startups, I still listen to the Equity podcast by Alex Wilhelm and, until recently, Kate Clark. This last week, they were talking about Ed-tech, or education technology – which got me thinking.

As you know, the section offers online and face-to-face courses. While we've been offering courses in some form for many years, like other smaller organizations, the industry of ed-tech has grown up around us, offering better tools for delivering courses and instruction. Famously, some have grown so fast through an offering of introductory topics and seminar-style overviews, only to be sold to larger organizations, i.e. Lynda went to LinkedIn years ago, but more recently Lambda and Galvanize.

Lambda has an interesting approach: the company offers coding education for free, but in exchange for a portion of the students' future income. Any student of history may recognize the similarities to colonial debt indenture. On the other hand, Lambda is simply cutting out the 'middle-man' of the student loan providers. Either way, it's a gamble on your own future, which is probably the best bet in any event.

Galvanize, provider of coding bootcamps and co-working spaces across eight locations in the U.S., was snatched up by K12, Inc for a reported $165 million. This is an interesting approach as there's no need to struggle to find space to offer the coursework and training.

I'm not sure the section is ready to offer the financial terms of Lambda, nor is it ready to purchase dedicated space. No, I think we'll continue to offer the courses in convenient locations near 128, where we often attend conferences anyway. As for locking onto our student's future wages like Lambda; our courses don't ask our students to carry that financial burden into their lives.

All that we ask is that the students learn as much as they can from us, take the knowledge into their workplace – and use it!

I can't end this editorial without mentioning the virus in the room. There is a deadly outbreak of 2019 Novel Coronavirus (2019-nCoV) impacting our lives around the world right now. Please keep your travel to a minimum, visit the Centers for Disease Control and Prevention (https://www.cdc.gov/coronavirus/2019-ncov/about/index.html) for the latest information and how to help prevent yourself.

Stay Safe. Please.

IEEE
Advancing Technology for Humanity

The Institute of Electrical and Electronics Engineers, Inc.

Spring 2020 Professional Development and Education Program

www.ieeeboston.org

Instructor Lead Courses*

Introduction to Blockchain Programming
Date: Thursday, February 27
Time: 9:00AM - 4:00PM

Practical Antenna Design for Wireless Products
Dates: Thursday, March 5 and Friday, March 6
Time: 9:00AM - 4:30PM

Python Applications for Digital Design
Dates: Monday, March 16 and Tuesday, March 17
Time: 8:00AM - 5:00PM

Digital Signal Processing for Wireless Communications
Dates: Monday, March 23, Tuesdays, March 31, April 7, and Mondays, April 13 and 27
Time: 6:00PM - 9:00PM

Software Development for Medical Device Manufacturers
Dates: Thursday, April 2nd and Friday, April 3rd
Time: 8:30AM - 5:00PM

Digital Signal Processing for Software Radio
Dates: Mondays, May 4, 11, 18 and Tuesday, May 26 and Monday, June 1
Time: 6:00PM - 9:00PM

***All Courses are held at the Crowne Plaza Hotel, 15 Middlesex Canal Park Drive, Woburn**

Online Courses

(Each Online Course - 90 day access for registrants!!!)

- **Verilog 101: Verilog Foundations**
- **Systems Verilog 101: (SV101) Design Constructs**
- **Systems Verilog 102: (SV102) Verification Constructs**
- **High Performance Project Management**
- **Introduction to Embedded Linux**
- **Software Development of Medical Device Manufacturers**
- **Reliability Engineering for the Business World**
- **Fundamental Mathematical Concepts Relating to Electromagnetics**
- **Embedded Linux Optimization**
- **Embedded Linux BSPs and Device Drivers**
- **Design Thinking for Technical Work**
- **Fundamentals of Real-Time Operating Systems**

For more information on these courses and other local IEEE activity see our website at www.ieeeboston.org, email: ieeebostonsection@gmail.com, or call 781-245-5405

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://ieeeboston.org/verilog-101-verilog-foundations-online-course/

System Verilog 101: Design Constructs
Full course description and registration at ,
http://ieeeboston.org/systemverilog-101-sv101-design-constructs-online-course/

System Verilog 102: Verification Constructs
Full course description and registration at ,
http://ieeeboston.org/systemverilog-102-sv102-verification-constructs-online-course/

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/

February Chapter Meeting Summary

Entrepreneurs' Network – 6:30PM, Tuesday, February 4
Crossing The Chasm - From First Sales to Building Sales Growth

This event is co-sponsored by The IEEE Boston Consultants Network
PRE-MEETING DINNER at 5:15 PM (sharp) at Not Your Average Joe's 4C Wayside Rd, Burlington, MA 01803. OK…You started a business and now aren't sure how to produce revenue beyond the friends and family networks. Do you need to begin your company's sales effort and don't know where to start or what to do? Simple questions yet no simple answers. Don't be confused by all the jargon out there! There are many different strategies and opinions but, every company is different therefore, your plan to roll out sales is going to be unique to your company. Our panelists combine many years of sales successes and failures in many verticals and will be joining together to discuss how to begin and ultimately consistently grow your sales. Meeting Location: Microsoft Technology Center, 5 Wayside Road, Burlington, MA 01803. See Page 8.

Communications Society – 7:00PM, Thursday, February 6
Frontiers in Networking - Speaker: Vincent Chan

This meeting is preceded by dinner with our guest speaker at Bertucci's, 475 Winter St, Waltham, MA at 5:30 PM. Future networks with orders of magnitude increase in data rates and large-granularity bursty traffic need an architecture with high efficiency that will also adapt dynamically to fluctuating offered loads and rapidly changing networks states. Moreover, applications and computing will impose new requirements on the network infrastructure, such as time deadlines. The current network management and control systems only adapt quasi-statically (from minutes to days) due to the smoothing effects of significant statistical multiplexing of traffic. Meeting Location: Verizon Technology Center, 60 Sylvan Road, Waltham, MA 02451. See Page 10.

Reliability Society – 5:30PM, Wednesday, February 12
Top Causes of Lithium Ion Battery Field Failures

You want to be proactive about the safety of your battery-powered product. Is qualifying your battery manufacturer to industry standards enough? The answer is that most compliance-based testing is related to abuse tolerance, but the vast majority of battery field failures happen under normal operating conditions. Compliance based testing is necessary but not sufficient to ensure lithium ion battery safety and reliability. Meeting Location: MIT Lincoln Laboratory, 3 Forbes Road, Lexington, Massachusetts. See Page 13.

Photonics Society – 6:30PM, Thursday, February 13
Reshaping Light using Metasurfaces: from Fisheyes to Reconfigurable Optics

Prof. Juejun (JJ) Hu of MIT will talk about reconfigurable optics using metasurfaces. Metasurfaces, devices capable of controlling the phase and amplitude of propagating light with arrays of subwavelength structures, present a promising solution towards flat and compact optical components. In this talk, I will discuss new advances in this field enabling metasurface optical systems with functionalities rivaling and even exceeding their conventional bulk optics counterparts. Meeting Location: MIT Lincoln Labs, 3 Forbes Road in Lexington, MA. See Page 12.

Entrepreneurs' Network – 6:00PM, Tuesday, February 18
Pointers for Term Sheet & Deal Negotiations

Company founders getting ready to raise outside financing do not want to give up more equity than absolutely necessary. Investors want more equity for their investment as a reward for the risk they are taking on the young company. Valuation is used to determine a fair trade-off of cash for equity. However, company founders need to consider the issues. What is a reasonable valuation for a startup? Must this determination be made when first obtaining funds? What terms might an entrepreneur see when presented with a Term Sheet, and what are the trade-offs when negotiating these? How do terms impact the Founders' managerial control of investments and operating decisions? Our panel, including two angel investors and a serial entrepreneur who has had successful exits, will discuss these issues concerning valuation and term sheets. Meeting Location: Draper, Hill Building, One Hampshire Street, Cambridge, MA. See Page 14.

IEEE Eta Kappa Nu (HKN) Induction Ceremony

IEEE-Eta Kappa Nu (IEEE-HKN), the honor society of IEEE, promotes excellence in the profession and in education with ideals of Scholarship, Character and Attitude.

It was founded on 28 October 1904 for students of electrical engineering. Today, IEEE-HKN promotes professional accomplishment, service, and development for students and professionals in electrical engineering, computer engineering, and other IEEE fields of interest.

The ceremony took place on Saturday, November 23, 2019 at the Westin Waterfront Hotel, Boston, MA. Criteria for Professional Membership in IEEE-HKN include: significant contributions in their area of expertise, commitment to service to their communities and others, and leadership. Candidates must be nominated with two endorsements.

There were five IEEE Boston Section members and one Worcester County Section member inducted during this ceremony.

What it means to me to be inducted into HKN –
Ramon de la Cruz, 2020 Chair, IEEE Boston Section.
To be inducted in HKN means that I've become part of a very special group of volunteers with the highest standard of leadership, character, and desire to help fellow peers become better professionals and better individuals.

I enjoyed the ceremony, particularly learning the history of HKN, how the logo was formed and the evolution of its symbols throughout the years,

It's important professionally because as part of the HKN family, I'll have opportunities to network, volunteer and serve with the best people of the engineering profession who share our common goals.

Thank you so much for inviting me to become part of the HKN family.

From Left to Right: Gilmore Cooke (Boston), Bruce Hecht (Boston), Lennart Long (Boston), Karen Panetta (HKN President), Rao Mannepalli (Worcester County), Marie Tupaj (Boston), Ramon de la Cruz (Boston)

Entrepreneurs' Network – 6:30PM, Tuesday, February 4

Crossing The Chasm - From First Sales to Building Sales Growth

This event is co-sponsored by The IEEE Boston Consultants Network

PRE-MEETING DINNER at 5:15 PM (sharp) at Not Your Average Joe's 4C Wayside Rd, Burlington, MA 01803
OK…You started a business and now aren't sure how to produce revenue beyond the friends and family networks. Do you need to begin your company's sales effort and don't know where to start or what to do? Simple questions yet no simple answers. Don't be confused by all the jargon out there! There are many different strategies and opinions but, every company is different therefore, your plan to roll out sales is going to be unique to your company. Our panelists combine many years of sales successes and failures in many verticals and will be joining together to discuss how to begin and ultimately consistently grow your sales.

Agenda:
6:30-7:30 PM - Registration & networking
7:30-7:40 PM - ENET Chairperson's announcements
7:40-7:55 PM - eMinute - Up to 3 Startup companies' presentations
7:55-8:45 PM - 3 expert speakers on the night's topic
8:45-9:00 PM - Audience / Speakers Q & A
9:00-9:30 PM - Final networking includes meeting presenting speakers

A question and answer session follow the presentation, and panelists will be available afterward for responses to individual questions. As with every ENET meeting, you will also get the chance to network with the panelists and other meeting attendees, both before the start of the meeting and afterward.

Panelists:
Depankar Neogi - CEO & Founder at ZipperAgent
Depankar Neogi leads the company's strategic direction and is also architect of the vision to create on-demand business software that is easy to use, affordable and yet grows with your business. Throughout his career, Depankar has evangelized breaking the norm and re-inventing processes with newer technologies. Depankar is a 20-year veteran of the software industry, an accomplished executive with management experience in high-growth SaaS & AI-based companies.

Prior to launching ZipperAgent, he spent 5 years at Intuit as Chief Architect where he helped grow their enterprise PaaS business by 400%. Prior to that, Depankar was CTO and co-founder of Copanion, a venture backed startup, where he architected the world's first SaaS based technology solution using image processing, machine learning/AI, and business rule engine technologies to accurately process a large variation of structured and un-structured business documents that saves accountants several hours per tax return by automatically extracting the data from tax source documents and populating the tax software.

Thomas Massie - CEO | Sales & Leadership Development | Sandler Training | WAVE Equity Partners | US Army Veteran
Thomas works with professionals who are committed to maximizing leadership and sales results. I helped them create a culture of high performers who embrace organizational excellence, increase lead generation, drive sales pipeline growth, improved pipeline predictability, shortened sales cycles, and accelerated revenues. I am passionate about business model innovation.

I'm dynamic business leader who has founded 3 companies; each experienced rapid growth, became market leaders, and all 3 companies achieved successful IPO's. Cumulatively my 3 ventures generated over $750 Million in revenue and in multiple years were recognized by Inc 500 and Deloitte Fast 500 as one of the fastest growing companies in America.

Natalie Nathanson - CEO of Magnetude Consulting

Natalie Nathanson is a tech sector entrepreneur with a passion for innovation, technology and the entrepreneurial spirit. With over 15 years of marketing experience, she has worked extensively with startups, small and mid-sized firms across the tech sector to drive towards company growth objectives. Natalie has expertise across a variety of marketing & sales disciplines including branding, messaging & positioning, demand generation, digital marketing, sales enablement, product marketing, channel marketing and inbound marketing and sales.

In 2012, she founded Magnetude Consulting, a B2B marketing firm that works with entrepreneurial firms who want to grow more rapidly and compete more effectively. Magnetude helps clients market the right way in today's increasingly complex environment by providing fractional marketing department services with full-service capabilities spanning marketing strategy, digital marketing, demand generation, channel & sales enablement, content development and brand visibility.

Moderator:

Tom Libby CEO of Diversified Sales Solutions, Inc and Co-Founder of Smarketing CONNECT

Tom is a seasoned Sales VP and Business Development Executive. He is a Co-Founder of the SmarketingConnect.com and also the CEO of Diversified Sales Solutions, Inc., a firm that provides outsourced sales solutions. Getting Sales strategy right is part vocation, part mission for Tom. Over the past 18 years Tom has developed his management, leadership, and sales skills in diverse industries and includes experiences in startups, small companies up to and including fortune 500 companies. He has received numerous awards and accolades during his career. He is a business professional with demonstrated results, as well as the ability to produce in high pressure situations. Today, Tom uses his sales & management experience to deliver interim management, training and coaching to small companies.

Directions: Microsoft Technology Center RT 128 / 95 to Rt 3 South to Wayside Rd.
Reservations: Please register at
https://boston-enet.org/event-3461317/Registration

This meeting is free to ENET members and $20 for non-members. No reservations are needed for the pre-meeting dinner. To expedite sign-in for the meeting, we ask that everyone -- members as well as non-members -- pre-register online. Pre-registration is available until midnight the day before the meeting. If you cannot pre-register, you are welcome to register at the door. Attendees must arrive before 7:30 pm. The entrance is locked after 7:30 pm.

Location: Microsoft Technology Center, 5 Wayside Road, Burlington, MA 01803

Registration: ENET Member Rate - Free, MDG Member – $15.00, Non-ENET Member Rate – $20.00, Student – $10.00
Register at
https://boston-enet.org/event-3461317/Registration

REFRESHMENTS: Snacks and soft drinks will be served at the meeting.

Communications Society – 7:00PM, Thursday, February 6

Frontiers in Networking

Speaker: Vincent Chan

This meeting is preceded by dinner with our guest speaker at Bertucci's, 475 Winter St, Waltham, MA at 5:30 PM.

Future networks with orders of magnitude increase in data rates and large-granularity bursty traffic need an architecture with high efficiency that will also adapt dynamically to fluctuating offered loads and rapidly changing networks states. Moreover, applications and computing will impose new requirements on the network infrastructure, such as time deadlines. The current network management and control systems only adapt quasi-statically (from minutes to days) due to the smoothing effects of significant statistical multiplexing of traffic. Future networks will see an increase in demand mostly due to large-granularity sessions. These granular sessions present large dynamic range and bursty offered traffic to the network, resulting in unpredictable congestions and blocking.

We will explore efficient and agile network algorithms to adapt quickly to changing network conditions: a cognitive network management and control system resides in the network control plane as a collection of coordinated algorithms that sense and infer network states, decide and implement fast scheduling of flows, predict intention of users/applications and take appropriate actions, perform rapid load balancing, and handle resiliency via reconfiguration/restoration/reconstitution of failed network assets.

Vincent Chan, Joan and Irwin Jacobs Chair Professor, Claude E. Shannon Communication and Network Group, EECS, MIT

Vincent W. S. Chan, the Joan and Irwin Jacobs Professor of EECS, MIT, received his BS(71), MS(71), EE(72), and Ph.D.(74) degrees in EE all from MIT. From 1974 to 1977, he was an assistant professor, EE, at Cornell University. He joined MIT Lincoln Laboratory in 1977 and had been Division Head of the Communications and Information Technology Division until becoming the Director of the Laboratory for Information and Decision Systems (1999–2007). He is currently a member of the Claude E. Shannon Communication and Network Group at the Research Laboratory of Electronics of MIT. In July 1983, he initiated the Laser Intersatellite Transmission Experiment Program and in 1997, the follow-on GeoLITE Program.

In 1989, he formed the All-Optical-Network Consortium among MIT, AT&T and DEC. He also formed and served as PI the Next Generation Internet Consortium, ONRAMP among AT&T, Cabletron, MIT, Nortel and JDS, and a Satellite Networking Research Consortium formed between MIT, Motorola, Teledesic and Globalstar. He has served on many US/non-US government advisory boards/committees and the Board of Governors of the Communication Society including VP of Publications. He chaired the Defense Science Board Task Force on Defense Communications, Networks and the Department of Homeland Security's Science and Technology Advisory Committee and as Chair of the Subcommittees on IoT/Smart-City and Cyber Security, the NSA Director's Advisory Panel and the very last Intelligence Science Board for the Director of National Intelligence. He also has been active with several start-ups and was a Board Member of a Fortune-500 network company and chaired its technical advisory board.

He is a Member of the Corporation of Draper Laboratory and is a member of Eta-Kappa-Nu, Tau-Beta-Pi and Sigma-Xi, and the Fellow of the IEEE and the Optical Society of America. He is currently the President of the IEEE Communication Society.

Throughout his career, Professor Chan has spent his research focus on communication and networks, particularly on free space and fiber optical communication and networks and satellite communications. His work has led the way to a successful laser communication demonstration in space and early deployment of WDM

optical networks. His recent research emphasis is on algorithmically-optimized heterogeneous network architectures with stringent performance demands.

Please circulate to interested parties.

Venue Note. This is our venue at the new Verizon Technology Center Campus in Waltham. The meeting begins at 7 PM at the new meeting auditorium at the Verizon Technology Center. The address is 60 Sylvan Road, Waltham, MA 02451. The entrance is by the far corner – with the picnic tables out front – and not the tower or the new building. It is most easily reached by the West Street entrance.

Important Note: Verizon Technology Center requests the names of the meeting attendees in advance of the meeting. If you plan to attend, please send a note via e-mail with your name to John Nitzke at RF@ieee.org by Wednesday, February 5th.

The meeting is preceded by dinner at Bertucci's, 475 Winter St, Waltham at 5:30 PM. The speaker will be joining us at dinner. Please let Bob Malupin know if you plan to attend the dinner at Bertucci's. Bob can be contacted at Robert.Malupin@VerizonWireless.com .

Directions to Bertucci's restaurant in Waltham: Take Exit 27B on I95/128, heading west on Winter Street. After exiting, stay all the way to the right and take the first right turn into the shopping plaza.

Directions to Verizon Technology Center (old Verizon Labs location), 60 Sylvan Rd. campus, Waltham, MA 02451: Take Exit 27B on I95/128, heading west on Winter Street. Stay all the way to the right. Verizon Technology Center is 1/2 mile ahead. At the second traffic light, turn left onto WEST ST. and then take the first right (at the Verizon sign) which leads into the Verizon campus. Take the first left. The building and entrance for the meeting are on your right. Note that the entrance to the auditorium area is by the far corner – with the red picnic tables out front – and not the tower or the new building.

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

Reliability Society – 5:30PM, Wednesday, February 12

Top Causes of Lithium Ion Battery Field Failures

Speaker: Vidyu Challa, PhD, Consulting Manager, Ansys-DfR Solutions

You want to be proactive about the safety of your battery-powered product. Is qualifying your battery manufacturer to industry standards enough? The answer is that most compliance-based testing is related to abuse tolerance, but the vast majority of battery field failures happen under normal operating conditions. Compliance based testing is necessary but not sufficient to ensure lithium ion battery safety and reliability.

In this presentation Dr. Vidyu Challa discusses broad categories of lithium ion battery field failures using industry data from 2005 onwards, whether abuse tests are relevant to field failures, and major areas where risk mitigation strategies should be implemented. She discusses manufacturing defects, abuse tolerance, adequacy of battery protection systems, end product battery application integration tolerance and battery usage conditions and how they contribute to failures.

Meeting Location: MIT Lincoln Laboratory, 3 Forbes Road, Lexington, Massachusetts
Vidyu Challa, PhD of ANSYS - DfR Solutions

Vidyu Challa is currently Consulting Manager at Ansys -DfR Solutions. Dr. Challa helps develop battery supplier qualification programs for companies in different industry verticals such as consumer, medical, aerospace, and industrial segments. She works on a range of battery challenges including supplier qualification, battery risk mitigation, root cause analysis, design reviews, and manufacturing audits. Dr. Challa teaches battery workshops at several industry conferences and Fortune 500 companies. Dr. Challa has published her work in journals, gives invited talks at conferences and frequently writes blog articles. She most recently published a book chapter on battery failure analysis in McGraw Hill's Handbook of Batteries.

Address: ANSYS - DfR Solutions, 9000 Virginia Manor Road, Suite 290, Beltsville, Maryland, United States, 20705
Agenda:
5:30PM Networking
5:45PM Light dinner - pizza, salad and beverages
6:00PM Opening and Announcements
6:20PM Technical Presentation and Q&A
7:30PM Adjournment

The meeting is open to all. You do not need to belong to the IEEE to attend this event; however, we welcome your consideration of IEEE membership as a career enhancing technical affiliation. Free pizza, salad, desserts, and beverages will be available. There is no cost to register or attend, but registration is required. Register

Email event contact: Michael W. Bannan, Chair Boston/Providence/New Hampshire Reliability Chapter at micahel.bannan@ieee.org

Registration: Starts January 24 and ends on February 12. https://events.vtools.ieee.org/m/215411

Photonics Society – 6:30PM, Thursday, February 13

Reshaping Light Using Metasurfaces: From Fisheyes to Reconfigurable Optics

Please Join us on Thursday, February 13th, for the fourth talk of the 2019-2020 IEEE Photonics Society Boston Chapter's Lecture Series. Prof. Juejun (JJ) Hu of MIT will talk about reconfigurable optics using metasurfaces. We hope you can make it.

We will have pizza dinner prior to the talk. Dinner and networking start at 6:30pm. Talk begins at 7:00pm. Located at MIT Lincoln Labs, 3 Forbes Road in Lexington, MA.

Metasurfaces, devices capable of controlling the phase and amplitude of propagating light with arrays of subwavelength structures, present a promising solution towards flat and compact optical components. In this talk, I will discuss new advances in this field enabling metasurface optical systems with functionalities rivaling and even exceeding their conventional bulk optics counterparts. In the first example, we demonstrate a single-piece metalens with an unprecedented near-180-degree field of view and aberration-free imaging over the entire field. The wide-angle metalens also features a remarkably compact and simple configuration involving only one metasurface layer on a flat substrate, and a planar focal plane ideal for optical system integration. In the second example, we further empower metasurface optics with electrically driven, low-loss optical reconfiguration capabilities by capitalizing on a broadband, bi-state transparent optical phase change material Ge2Sb2Se4Te1 (GSST) we developed. Reconfigurable meta-optical devices such as varifocal lens and tunable beam deflector are demonstrated.

Biography: Juejun (JJ) Hu received his B.S. from Tsinghua University, China, in 2004, and his Ph.D. from Massachusetts Institute of Technology (MIT), USA, in 2009, both in materials science and engineering. He is currently an associate professor at MIT's Department of Materials Science and Engineering. Prior to joining MIT, he was an Assistant Professor at the University of Delaware, USA from 2010 to 2014. Hu has authored and coauthored more than 100 refereed journal publications. He has been recognized with the SPIE Early Career Achievement Award, the Robert L. Coble Award from the American Ceramic Society, the DARPA Young Faculty Award, the NSF CAREER Award, among others. His research primarily focuses on integrated optics and photonics. His main scientific and technical contributions include the demonstration of digital Fourier Transform (dFT) spectroscopy, mechanically flexible and stretchable photonic circuits, a panoramic dielectric metasurface lens, an optical phase change material with broadband transparency at both phases, and the first optical isolator monolithically integrated on silicon.

Further information: http://www.bostonphotonics.org/

IEEE Boston Section Social Media Links:

Twitter: https://twitter.com/ieeeboston

Facebook: https://www.facebook.com/IEEEBoston

YouTube: https://www.youtube.com/user/IEEEBostonSection

Google+: https://plus.google.com/107894868975229024384/

LinkedIn: https://www.linkedin.com/groups/IEEE-Boston-Section-3763694/about

Entrepreneurs' Network – 6:00PM, Tuesday, February 18

Pointers for Term Sheet & Deal Negotiations

Location: Draper, Hill Building, One Hampshire Street, Cambridge, MA

Company founders getting ready to raise outside financing do not want to give up more equity than absolutely necessary. Investors want more equity for their investment as a reward for the risk they are taking on the young company. Valuation is used to determine a fair trade-off of cash for equity. However, company founders need to consider the issues.

What is a reasonable valuation for a startup? Must this determination be made when first obtaining funds?

What terms might an entrepreneur see when presented with a Term Sheet, and what are the trade-offs when negotiating these? How do terms impact the Founders' managerial control of investments and operating decisions?

Our panel, including two angel investors and a serial entrepreneur who has had successful exits, will discuss these issues concerning valuation and term sheets.
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A question and answer session follow the presentation, and panelists will be available afterward for responses to individual questions. As with every ENET meeting, you will also get the chance to network with the panelists and other meeting attendees, both before the start of the meeting and afterward.

Speakers:
Ziad H. Moukheiber, CEO, Boston Harbor Angels, Inc.

Ziad H. Moukheiber, CEO, Boston Harbor Angels, Inc.,one of the leading angel investing groups in the US. He is also Managing Partner at EQX Fund LLC, an angel and early stage investment fund based in Boston Massachusetts focusing on Life Sciences and IT.A business leader with over two decade of experience in building scalable organizations and advising companies in sales, marketing, operations, IT, service delivery, and customer service, Ziad founded SilverSword in 1998. He and his team built SilverSword into a leading IT consulting company that provides an outstanding customer service experience for their New England area clients. Silversword was acquired in 2015 by NSK Inc. Ziad is an active angel investor and on the board of businesses and nonprofit organizations with a special interest in technology. Ziad is also a mentor with BUILD a nonprofit organization using entrepreneurship to help at risk students in the Boston area. Ziad earned his BA at the American University of Beirut (1992) and his Master's degree at the Interactive Telecommunications Program at the Tisch School of the Arts of New York University (1996). Founded in 1979 as the first graduate education program in alternative media, ITP is internationally recognized as a unique and vital contributor of new ideas and talented individuals to the professional world of multimedia and interactivity.

Dr. Mark A. Tepper, President & CEO, Eumentis Therapeutics Inc.
Dr. Mark A. Tepper has over 30 years of experience in the biotechnology and pharmaceutical industry. He has led drug discovery & drug development programs that span a wide range of therapeutic areas including Oncology, Immunology, Rheumatology, Endocrinology, Metabolic Diseases, CNS, Inflammation and Pain. In addition, he has founded multiple companies based on novel technology in the areas of RNA interference, structure-based drug design, small molecule and protein therapeutics, biosensors, microfluidics and biomaterials. Following a 15 year career in large Pharma in R&D, Dr Tepper became a serial entre-

preneur where he founded multiple biotech companies based on technology spun out from academic institutions. His role in these companies included technology sourcing, due diligence, company formation, term sheet negotiations, capitalization, commercialization and business planning and operations, IP licenses and executive management recruitment. At each of these companies he served as part of the executive management team, helping to execute on the business & development plan.

In the last 15 years, Dr. Tepper has raised over $200M in capital for his ventures. He has taken two of his companies public, and sold another company in a trade sale. His most recent venture Corbus Pharmaceuticals (CRBP) is developing novel breakthrough medicines to treat serious life-threatening inflammatory and fibrotic diseases. Its lead drug candidate, Lenabasum is currently in late stage clinical trials in a number of indications. Corbus IPO'ed in 2014, and currently has a market cap of ~$400M His other companies have included; Primatope Therapeutics (acquired by Kiniksa in Feb 2019), developing novel best-in-class humanized CD40 monoclonal antibodies to treat autoimmune diseases and organ transplant rejection; NKT Therapeutics, developing medicines based on Natural Killer T Cells to treat sickle cell crisis and asthma; RXi Pharmaceuticals (NASDAQ: RXii) developing RNAi therapeutics to treat wound healing and scarring; and Arradial, which developed a microfluidics based screening tool for identifying new drugs from human genome targets. Dr. Tepper earned a Ph.D. in Biochemistry & Biophysics from Columbia University, College of Physicians and Surgeons, New York, and a B.A in Chemistry with Highest Honors from Clark University, Worcester, Mass. He did his postdoctoral fellowship at University of Massachusetts Medical School, Worcester in the laboratory of Michael P. Czech. He has over 50 scientific publications and is the co-inventor of multiple drug related patents. Dr. Tepper's hobbies include SCUBA diving, fishing, boating, marine aquaria, beer making, and gardening. (Bio and jpeg picture to be supplied)

Deb Kemper, Managing Director, Boston Chapter of Golden Seeds, http://www.goldenseeds.com/ , Twitter: @Deb_Kemper

Deb Kemper is Managing Director of the Boston Forum of Golden Seeds, a national angel investor group. She is also a member of Clean Energy Venture Group. Her investment focus is high growth companies in the clean tech, health care, and technology sectors.

Previously, Deb was a consultant with McKinsey & Company where she served clients in a variety of industries including energy, utilities, electronics, and healthcare. Her functional experience includes manufacturing, product development, operations, strategy, professional development, and leadership coaching. She has provided leadership support to organizations in China, Peru and the United States.

Deb earned her MBA from the Amos Tuck School at Dartmouth College where she was named an Edward Tuck Scholar. She holds a Bachelor of Science degree in Civil & Environmental Engineering from Cornell University where she graduated With Distinction and was a member of the Varsity Women's Crew.

Moderator and Co-Organizer
Kristin King, MBA. Vice President, Corporate Development & Strategy, Defibtech, LLC

Kristin is an accomplished MedTech executive, serial intrapreneur, investor and strategic advisor to startups developing biotech solutions. With a distinguished career addressing commercial strategy over 20 years spanning technical, marketing, and business development disciplines, she offers multi-discipline expertise and repeated track record for high impact Medical Device development transforming technologies from early concept to successful global divisions at leading Medical Device companies and startups.

Kristin is recognized for her strategic development, business acumen, and her ability to build and lead talented teams to commercialize products that change patients' lives. Starting her career designing stents, a patent inventor for Johnson & Johnson's drug eluting stent and progressing through marketing and global commercial leadership roles, she has contributed to some of the world's most meaningful programs at top healthcare firms including Ansell Healthcare, Becton Dickinson, Johnson & Johnson Cordis, Abbott Vascular, and Pfizer. Her category expertise includes advanced

wound care, infection prevention, diabetes care, interventional cardiology/ radiology, and other surgical specialties in hospital, alternate site and consumer retail segments.

In 2017, after founding Ansell Healthcare's advanced therapeutic segment, Kristin focused her career on the Boston startup community progressing MIT spin off Rogers Sciences to clinical trials, FDA submission as well as proud member of Boston Harbor Angels. Kristin holds a B.S. in bioengineering from Syracuse University, MBA in Finance & Marketing from NYU Stern. Outside of the office she is an avid scuba diver and volunteer for environmental organizations Beneath the Sea and Boston Sea Rovers.

Co-Organizer:
Robert Adelson, business and tax attorney, partner @ Engel & Schultz LLP (Boston) and Chair Emeritus @ Boston Entrepreneurs' Network (ENET).

Rob has been an attorney for over 30 years specialized in business, tax, stock and options, employment, contracts, financing, trademarks and intellectual property. Rob began as an associate at major New York City law firms before returning home to Boston in 1985 where he has since been a partner in small and medium sized firms before joining his present firm in 2004. Rob represents entrepreneurs, start-ups and small companies, independent contractors and employees and executives. Rob is a frequent speaker on business law topics and author of numerous articles published in Boston Business Journal, Mass High Tech and other publications. He has been named among the "Top 20 Boston Startup Lawyers" by ChubbyBrain.com, a website that provides tools for entrepreneurs. Rob has been on the ENET Board since 2002, was Vice Chair 2005-2009, and ENET Chairman 2009-2019. He was also a Co-Founder and Board member of the 128 Innovation Capital Group (2004 -2015). In 2016, he received the IEEE USA Professional Achievement award for "extreme dedication to the entrepreneurship community." He holds degrees from Boston University, B.A., summa cum laude, Northwestern University (Chicago), J.D., Law Review, and New York University, LL.M. in Taxation. His website - www.ExecutiveEmploymentAttorney.com

Registration: ENET Member – Free; Non-ENET Member – $10.00
Register at
https://boston-enet.org/event-3461318/Registration

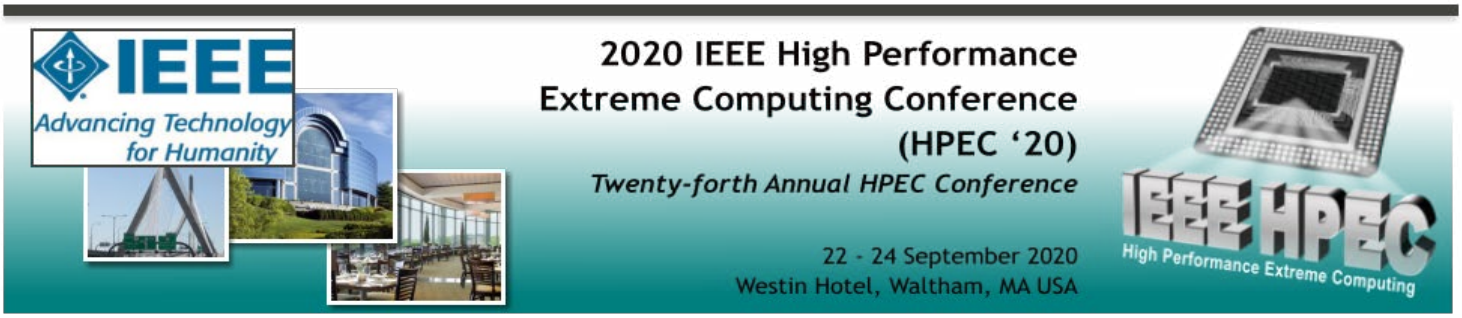
This ENET meeting is free to ENET members and $10 for non-members. To expedite sign-in and order refreshments for the meeting, we ask that everyone -- members as well as non-members -- pre-register for the meeting online. If you cannot pre-register, you are welcome to register at the door.

REFRESHMENTS: Pizza, salad, and soft drinks will be served at this meeting.

LOCATION: Draper, Hill Building, One Hampshire St. Cambridge, MA 02139. The address is One Hampshire St, but the entrance is actually on Broadway. Attendees must arrive at Draper before 7 pm. Entrance is locked after 7 pm.

PUBLIC TRANSPORTATION: Kendall Square stop on the Red Line.

CALL FOR PAPERS



www.ieee-hpec.org

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
- Secure Computing & Anti-Tamper Technologies

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.

HPEC 2020

SEPTEMBER 22 – 24

DSP for Software Radio

(13 hours of instruction!)

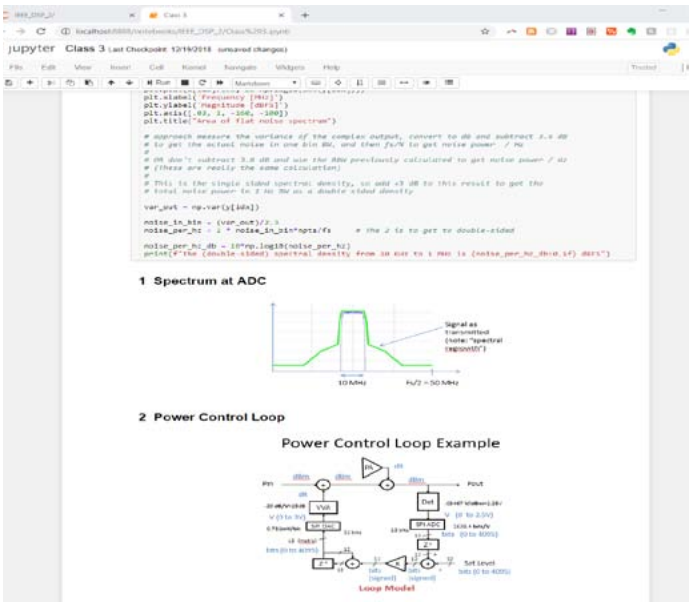
Time & Date: **6:00 - 9:00PM, Mondays, May 4, 11, 18, 26*, June 1 *Note: May 26 is a Tuesday**

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

Speaker: **Dan Boschen**

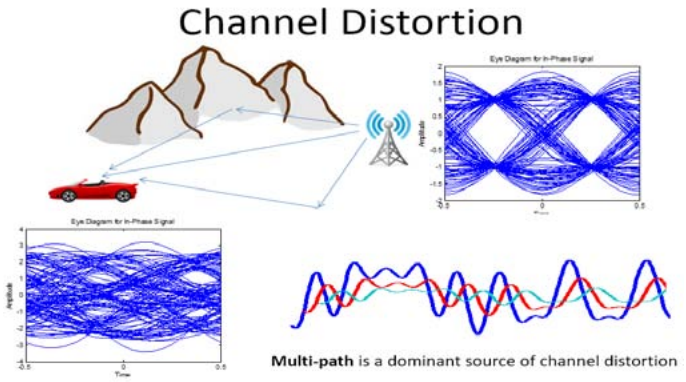
Course Summary

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.



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



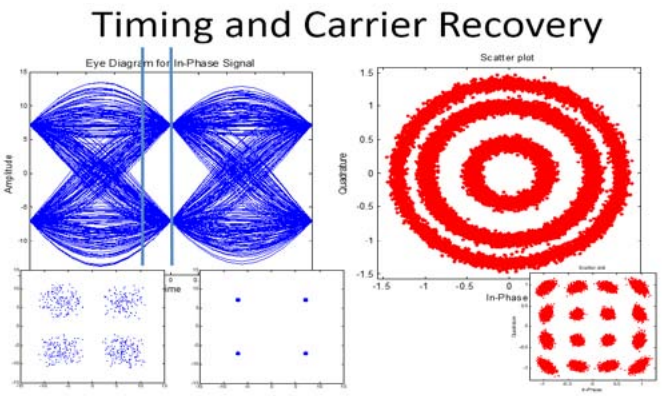
for mixed signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges, rather than a tutorial on implementations with DSP processors.

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.

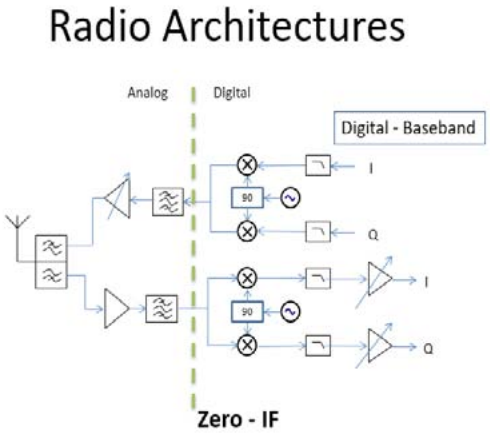
This course will not be teaching Python, but using it for demonstration. A more detailed course on Python itself is covered in a separate IEEE Course "Python Applications for Digital Design and Signal Processing".

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.



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 Monday, April 27

Payment received by April 22	
IEEE Members	**$340**
Non-members	**$375**
Payment received after April 22	
IEEE Members	**$375**
Non-members	**$415**

http://ieeeboston.org/digital-signal-processing-dsp-wireless-communications-radio/

DSP for Wireless Communications

(13 hours of instruction!)

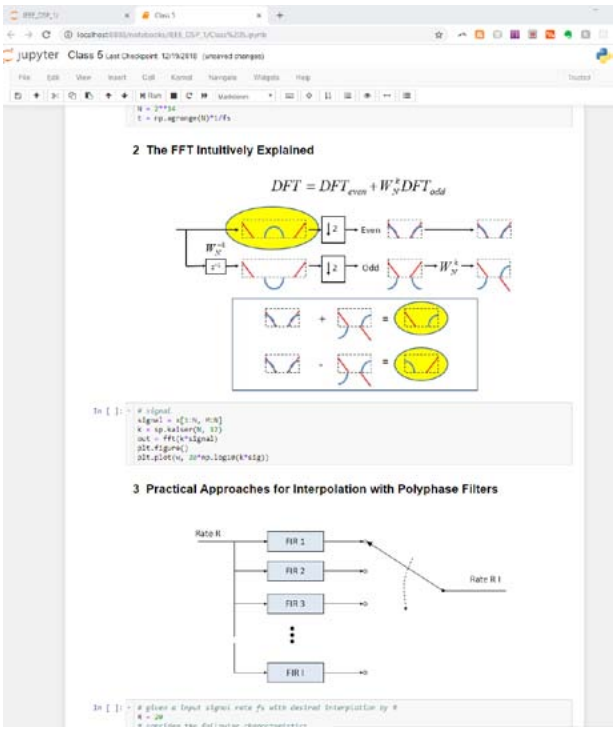
Time & Date: **6:00 - 9:00PM, March 23, 31, April 7, 13, 27 (Note date Changes)**
(March 23, April 13 & 27 are Monday, March 31 and April 7 are Tuesday)

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".

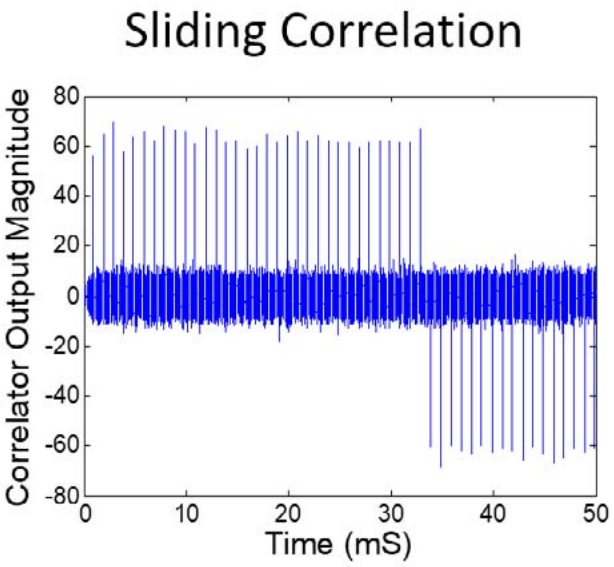
Students will be encouraged but not required to bring a laptop to class, and all set-up information for installation will be provided prior to the start of class.

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.

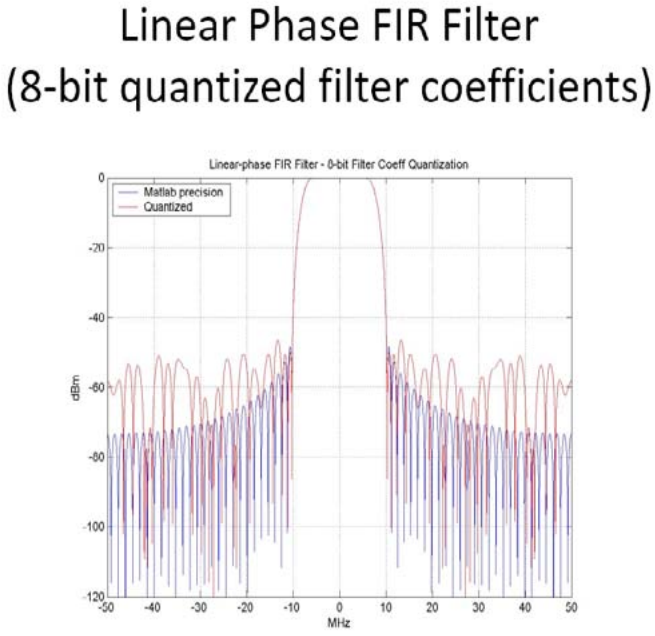


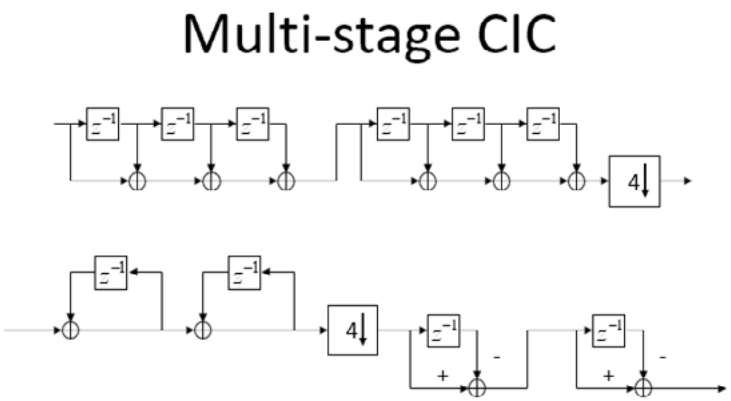
Class 4: Windowing, Digital Filter Design, Fixed Point vs Floating Point

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.





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 Tuesday, March 17

Payment received by March 13
IEEE Members $350
Non-members $385

Payment received after March 13
IEEE Members $385
Non-members $420

http://ieeeboston.org/%20digital-signal-processing-dsp-wireless-communications/

Python Applications for Digital Design and Signal Processing

(14.5 hours of instruction!)

Time & Date: 8:30AM - 5:00PM, Monday & Tuesday, March 16 & 17
Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA
Speaker: Dan Boschen

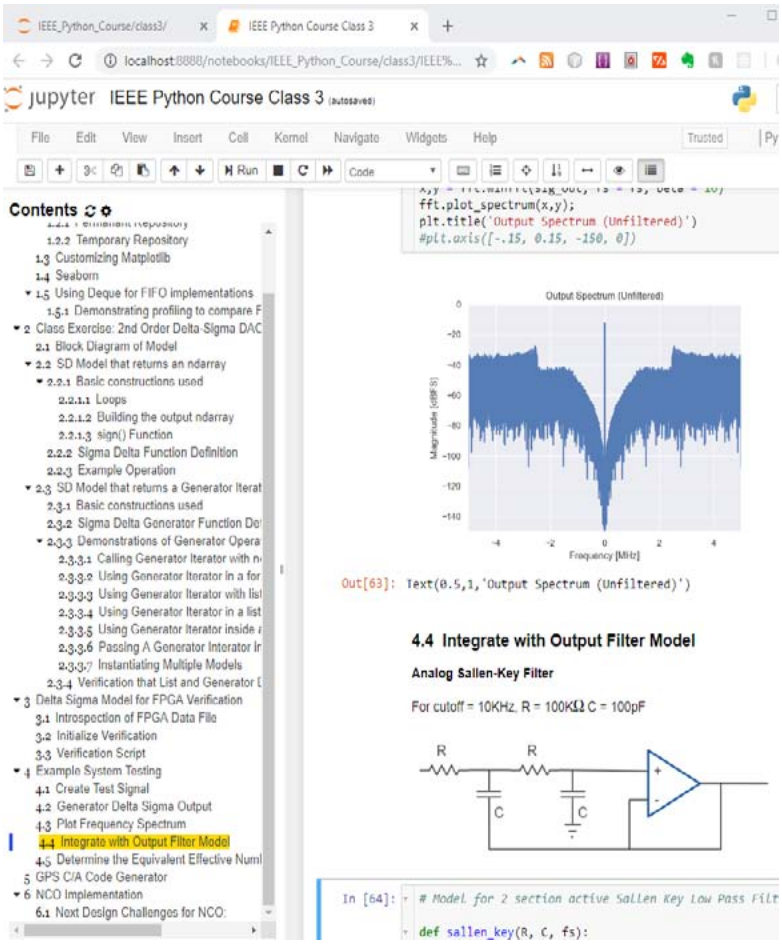
Course Summary

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.

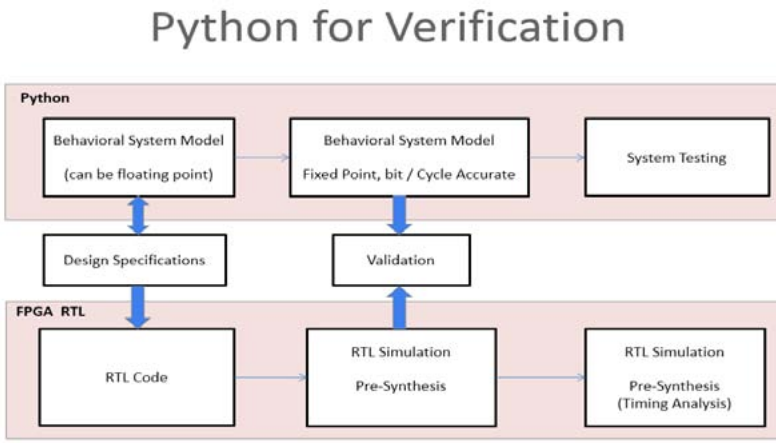


Jupyter Notebooks: This course makes extensive use of Jupyter Notebooks which combines running Python code with interactive plots and graphics for a rich user experience. Jupyter Notebooks is an open-source web-based application (that can be run locally) that allows users to create and share visually 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 Symmetricom) leading design efforts for advanced frequency and time solutions.



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

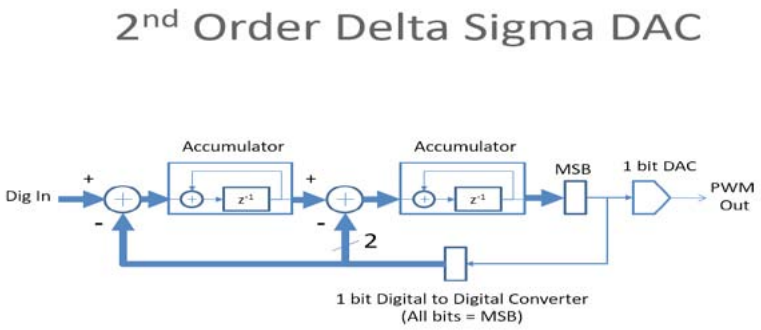
10:15am-12:00 pm Signal processing simulation with popular packages including NumPy, SciPy, and Matplotlib, continued.

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.



notes, lunch and coffee breaks included with registration

Decision (Run/Cancel) Date for this Courses is Monday, March 9

Payment received by March 5
IEEE Members $450
Non-members $495

Payment received after March 5
IEEE Members $495
Non-members $535

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

Practical Antenna Design for Wireless Products

Time & Date: 9:00AM - 4:30PM, Thursday, & Friday, March 5 & 6, 2020

Speaker: Henry Lau, Lexiwave Technology

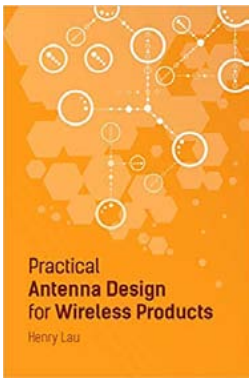
Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA

INTRODUCTION

To stay competitive in today's fast evolving business environment, faster time to market is necessary for wireless communication products. Playing a critical role in determining the communication range of products, RF design, particularly the antenna design, becomes crucial to the success of the introduction of new wireless products. Competence in advanced antenna designs can definitely strengthen the competitive edge of RF product design or manufacturing companies.

COURSE OBJECTIVES

This 2-day course aims to provide participants with technical insights on the vital aspects of antenna design from a practical and industrial perspective. It covers the fundamental antenna concepts and definitions, specifications and performance of different types of commonly-used and advanced antennas in RF products. Simulation tools will be introduced and discussed. Practical implementation strategies in RF products for optimum antenna performance will also be presented.



A complimentary book - 'Practical Antenna Design for Wireless Products', authored by the Speaker, will be distributed to each participant.

WHO SHOULD ATTEND

Antenna designers, RF designers, wireless product designers, field application engineers, business development engineers and managers, design managers, and related professionals.

COURSE CONTENT

Day 1 (5 March)

Fundamental Concepts

1. Antenna Fundamental
   - Basic types of Antenna
     - Dipole, Monopole, helical, loop, printed PCB
   - Radiation Mechanism
     - Source of radiation
     - Characteristics of radiation

2. Specification and Performance
   - Radiation pattern
   - Antenna efficiency, aperture
   - Impedance and circuit matching
   - Directivity, gain
   - Friis Transmission Equation

3. Antenna Elements
   - Dipole antenna
   - Monopole antenna
   - Multi-band antenna
   - Miniature chip type antenna
   - Loop antenna

Day 2 (6 March)

Advanced Antenna Elements

4. Miniature antenna for portable electronics
   - Patch, inverted-L, inverted-F
   - Meandered line, multi-band

5. CAD Design and Simulation
   - CAD tools
   - Design strategies
   - Limitations

Case studies

Practical implementation strategies

6. How to design good antennas
   Understand the requirements
   Selection of antenna type, size and geometry
   Location and placement

7. Team work with product designers, electronic engineers and mechanical engineers
   Why it matters
   Case studies on designing good antennas

EXPERTISE

Henry Lau received his M.Sc. and MBA degrees from UK and USA respectively. He has more than 27 years of experience in designing RF systems, products and RFICs in both Hong Kong and US. He worked for Motorola and Conexant in US as Principal Engineer on developing RFICs for cellular phone and silicon tuner applications. Mr Lau holds five patents all in RF designs. He is currently running Lexiwave Technology, a IoT and wireless solutions company in Hong Kong and US designing and selling RFICs, RF modules, Radar and IoT solutions. He has also been teaching numerous RF-related courses internationally.

notes, text, lunch and coffee breaks included with registration

Decision (Run/Cancel) Date for this Courses is Tuesday, February 25, 2020

Payment received by Feb. 21
IEEE Members $450
Non-members $485

Payment received after Feb. 21
IEEE Members $485
Non-members $525

http://ieeeboston.org/practical-antenna-design-wireless-products/

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.

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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.

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

Introduction to Blockchain Programming

Time & Date: **9:00AM - 4:00PM, Thursday, February 27, 2020**

Speaker: **Christine Miyachi, Xerox, Corp.**
Ken Miyachi, San Diego Supercomputer Centers BlockLAB

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

Course Summary

This is a part-lecture/ part-bring-your-own laptop, hands-on course in Blockchain programming. Some programming experience is required.

After providing an introduction to Blockchain, we'll review cyptography which is an underlying technology of Blockchain. Then we will dive right into Etherum, the largest Blockchain platform used today. Then we will work with crypto-zombies - an interactive code school that teaches you to write smart contracts in Solidity through building your own crypto-collectables game. After that we'll introduce tools to use Ethereum.

Target Audience

Engineers and managers of engineers with some programming background who want to understand the mechanics of Blockchain. This is a class with both lecture and hands on exercises.

Goals/benefits of attending

You will understand the basics of blockchain and know the basic tools of programming blockchain.

Outline

1. Blockchain Primer
2. Cryptography - Public and Private Key cryptography 3. Ethereum Basics - programming in ethereum
4. Crypto Zombies Tutorial
5. Ethereum Tools
6. ERC 20 Smart Contract
(https://www.investopedia.com/news/what-erc20-and-what-does-it-mean-ethereum /)
7. Intro to HyperLedger
8. HyperLedger Tutorial - Hyperledger Fabric

Prerequisites (in this case, laptop, etc.) A PC running Virtual Box. There will be a Virtual Box environment that will be provided for the class.

Speakers Expertise

Christine Miyachi has almost 30 years of experience working for startups and large corporations. She writes a blog about software architecture: http://abstractsoftware.blogspot.com/ . She is currently a principal systems engineer and architect at Xerox Corporation and holds several patents. She works on Xerox's Extensible Interface Platform which is a software platform upon which developers can use standard web-based tools to create server-based applications that can be configured for the multi-function peripheral's touch-screen user interface .

Miyachi graduated from the University of Rochester with a BS in electrical engineering. She holds two MIT degrees: an MS in technology and policy/electrical engineering and computer science and an MS in engineering and management. Chris is the chair of the IEEE Boston Blockchain group (https://www.meetup.com/Boston-

IEEE-Blockchain-Meetup-Group/). See more about Chris at www.christinemiyachi.com

Ken has a Computer Science degree from the University of California, San Diego and is currently a Principal Investigator at the San Diego Supercomputer Centers BlockLAB and the Chair for the IEEE San Diego Blockchain Initiative. After working in Natural Language Processing and Blockchain Development he was extremely interested in the potential of decentralized solutions in the compliance and regulatory space. He is the CEO of LedgerSafe. Find more about Ken at http://www.kenmiyachi.com

notes, lunch and coffee breaks included with registration

Decision (Run/Cancel) Date for this Courses is Tuesday, February 18, 2020

Payment received by Feb. 14
IEEE Members $195
Non-members $225

Payment received after Feb. 14
IEEE Members $225
Non-members $255

http://ieeeboston.org/introduction-to-blockchain-programming/

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Software Development for Medical Device Manufacturers: An Intensive Two-day Workshop

Time & Date: 8:30AM - 4:30PM, Thursday & Friday, April 2 & 3

Speaker: Steve Rakitin, President, Software Quality Consulting, Inc.

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

OVERVIEW

Developing software in compliance with the FDA Design Control regulation, changing FDA guidance documents and latest international standards is challenging. This two-day 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 expectations for validation of software development tools and software used in Manufacturing and Quality Systems. Recently issued FDA Guidance Documents on Cybersecurity, Mobile Apps, and Usability are discussed. Interactive group exercises are included to facilitate discussion and learning.

WHO SHOULD ATTEND

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. Each attendee receives course notes, access to an extensive collection of reference documents and a training certificate.

COURSE OUTLINE

- **Introduction**
  - Medical Device Definitions – FDA and EU
  - Regulatory Roadmap and FDA/EU Device Classification Schemes
  - FDA Regulations and Guidance Documents for Software
  - Standards – ISO 13485, IEC 62304, ISO 14971, EN-14971, IEC 60601, and IEC 62366-1
  - All Software is Defective

- **Interpreting Design Controls for Software**
  - Software Development Models
  - Design and Development Planning
  - Design Inputs
  - About Requirements… Requirements Exercise
  - Design Outputs
  - Design Reviews
  - Design Verification

- **Software Verification Techniques**
  - Design Validation

- **Software Validation Process**
  - Design Transfer
  - Design Changes
  - Design History File

- **Validation of…**
  - Software Tools used to develop Medical Device Software
  - Software used in Manufacturing
  - Software used in Quality Systems
- **Risk Management**
  - Standards and Regulations

– Terms and Concepts
– Risk Management Process
– Risk Management Tools and Techniques
Fault Tree Exercise
– Data Collection and Analysis
– Documentation Requirements

- **Course Summary**

- **Comprehensive reference materials included**

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.

As President of Software Quality Consulting Inc., he helps medical device companies comply with FDA regulations, guidance documents, and international standards in an efficient and cost-effective manner.

notes, lunch and coffee breaks included with registration

Decision (Run/Cancel) Date for this Courses is Thursday, March 26, 2020

Payment received by March 23
IEEE Members $495
Non-members $535

Payment received after March 23
IEEE Members $535
Non-members $565

http://ieeeboston.org/software-development-medical-device-manufacturers/

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