

BOSTON



2019 IEEE SYMPOSIUM
ON PHASED ARRAY
SYSTEMS AND
TECHNOLOGY

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2019 HIGH
PERFORMANCE
EXTREME COMPUTING
CONFERENCE

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2019 IEEE SYMPOSIUM
ON TECHNOLOGIES FOR
HOMELAND SECURITY

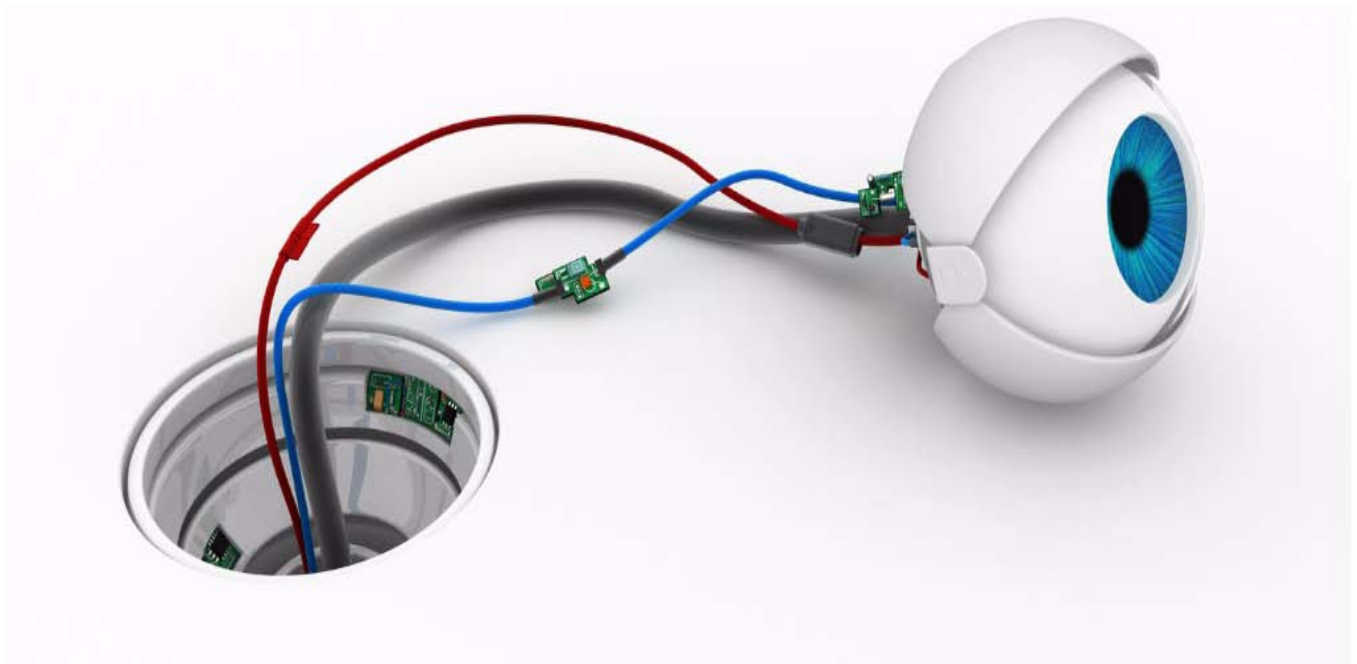
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IEEE BOSTON
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THE REFLECTOR

ISSUE #8
AUGUST 2019



**2018 Outstanding Section Membership
Recruitment and Retention Performance**

Boston Section

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Ethical Bribing

by Karen Panetta, Reflector Editor

Every year on Christmas Eve, Santa Claus would drive through my home town sitting on top of a firetruck waving to people lined up on the sidewalks as he drove by. My father and I made it a tradition to hold hands and huddle together in the cold night air, as we eagerly awaited Santa to pass by my house. Santa never stopped for anyone along his 3-hour ride, but he would stop and hop down off the firetruck for me. I felt super special. To be honest, as a child, Santa terrified me. We teach our kids to be cautious of strangers yet, I was supposed to be ok with Santa Claus, even though he seemed to change his size and appearance at every instance on every street corner and shopping center. Never the less, I was the envy of all the kids in the neighborhood because Santa would stop at my house.

When I was older, I asked my father how he managed to get Santa to stop just for me. He smiled and said, "A bottle of whiskey and a \$100.00 bill."

From then on, whenever I was hoping a decision would go my way that was under the control of another individual, my father would open his wallet, hand me a \$100.00 bill and point to the liquor cabinet. He was jokingly implying that the Santa bribing method was foolproof and would work on everyone. He was joking that I should use it to influence people to get the outcome I wanted. We would have a good laugh and I would keep the \$100. This routine always helped defuse my stress over the uncertainty of any situation that I was waiting for closure on. Oddly enough, I never spent the cash he gave me.

Fast forwarding to the present, I have to admit I was not totally surprised when the news was flooded with stories about rich and famous people bribing school officials, falsifying documents and cheating on tests to get their children into brand name schools. I just didn't realize

what a lucrative business it was! I know wealthy parents can afford to get their children access to opportunities that will make their kids shine on college applications, as well as pay for professional advisers to help their kids embellish their college applications. However, I was surprised that parents would intentionally and grossly falsify credentials, pay off people to lie or have someone take the standardized tests for their kids. Why would they go to these extremes? Did they not believe their kids were good enough? Or would they have been embarrassed or feel less than their fellow parent peers, if their kids didn't get into those brand-named schools, while their friends' children did? Did they not have a big enough check book to buy a building for the school to bribe the school ethically to accept their kid? And yes, I know using the word "ethically" and "bribe" is some kind of oxymoron. The point is that we see it happening every day. We are only surprised by the news of bribing to gain admissions into schools because of the excessive costs it fetched and the willingness of parents to do it.

Would people have a problem if someone donated \$70 Million to a school with a promise to gain acceptance for their kid, if it came along with a documented commitment to financially support the education of 200 other underprivileged or middle-class kids at the same institution? Probably not, because it was open and declared up front. However, the poor rich kid would most likely be scrutinized that he/she/they only got in because mama and papa wrote a big enough check and not because they were smart.

Here's the problem: The pressure to get into the brand name schools (notice, I don't say best schools!) is overwhelming. For most students, getting into a top ranked school is coupled with suffocating thoughts of debt. We live in a culture where the brand name of the institution

means more than the quality of the education. Students who work part-time jobs and attend schools they can afford are super successful. Regardless of what school a person attends, it is the individual who ultimately gets out of their education, what they put into it.

While diversity within academic institutions is the politically correct word of the day, we see no diversity of institutions represented in the country's academic leadership or national science and engineering boards. Meanwhile, everyone scratches their heads wondering why higher education is so out of touch with the public and the majority of the population. Cases of mental illness and student suicides are exploding. Schools race to hire mental health counselors in an attempt to stop the tsunami of cases caused by stress and pressure placed on these young people.

Further exasperating the situation is the caste system that is metastasizing in academia. Faculty employed in academia openly discriminate against community colleges and online degree providers. These programs are dismissed as lower-class, bargain basement education. To them, the only thing worse than a community college education is an online degree.

The most wonderful engineers and impactful citizens I have met have earned their education at a diversity of institutions. As obvious as it may sound, you get out of education what you put into it. Going to a brand name school does not make one a better engineer, than someone else who went to a community college or earned their degree online. And where an individual earns a degree certainly does not mean that one person possesses more upstanding character than the other, even though some schools would like you to think it does. Yes, quality facilities may matter and access to latest technology matters, but each school, even online education providers, have their own way of ensuring quality delivery of education.

Every school has a network, and it is access to those networks that people really want to buy into. Unfortunately, if only the brand name schools have a presence in the upper echelon positions and political appointments, it makes it really hard for others, not in that clique, to get equal access. This is especially true for underrepresented groups of individuals. We have diversity initiatives in schools to bring in students from all different backgrounds, gender and economic status, but look at

the faculty. Have any of them attained their degrees from the cheapo depot of schools or online? Most likely not.

So, how does this all fit in with the rich and famous parents bribing their kids' way into brand name schools? It shows that education needs a public awareness makeover. It shows that, while valuing diversity within institutions is a song sang at every institution, it's being sung out of tune and out of tempo. We need to value the diversity of the many kinds of institutions and the hard-working talented individuals that graduate from them.

The educational paths successful people took required resilience and resourcefulness. Many work multiple jobs, supported families and learned along the way how to juggle life, work and parenting. Going to school is not a place to go just to "find yourself", it's too expensive. It's a place to be educated and gain the competencies to build the foundations for a career that will hopefully enrich lives of the individual and future generations.

Sorry to shock you, but Institutions are actually influenced by the giving potential and public stature of a candidate's family. If they tell you it plays no role, they are giving you an alternative "truth". It's happening, so why not make it ethical by opening the bidding and having their kid understand that they are part of the philanthropic deal to help sponsor other middle-income/low-income, diversity students?

If institutions stopped proclaiming that students get accepted solely based on their own personal merit and credentials, and instead, had an open incentive program (you pay for your kid plus a premium to support many more strong students that can't afford to come), then the institutions would be getting those millions of dollars to support the much needed financial aid for deserving students and avoid the high priced bribing scams. Perhaps then, schools would truly have some diversity.

The opinions presented here are solely those of the author and not of the IEEE or the author's employer. If you have any complaints or difference of opinion, you are welcome to write it on the back of a one-hundred dollar bill and send it to the IEEE Foundation.

<https://www.ieeefoundation.org/donate>



2019 IEEE International Symposium on Phased Array Systems and Technology

Revolutionary Developments in Phased Arrays



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15–18 October 2019

Westin Waltham Hotel,
Greater Boston,
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www.array2019.org



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- Radar Systems
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- 5G Arrays

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- Dual-Polarization Weather Radar Arrays
- Wideband Array Apertures
- Dr. Hans Steyskal: A Tribute to his Life and Contributions to Phased Array Systems and Technology

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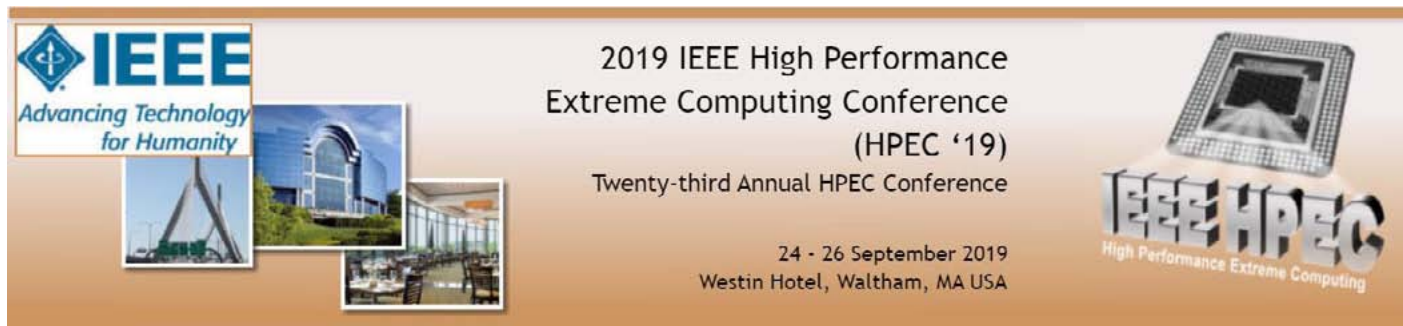
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The IEEE High Performance Extreme Computing Conference (HPEC '19) will be held in the Greater Boston Area, Massachusetts, USA on 24 – 26 September 2019

Presentations that describe advances in high performance extreme computing technologies will be presented at this conference which is to be the premier conference in the world on the confluence of HPC and Embedded Computing.

Confirmed Distinguished Speakers:

Marc Hamilton (Nvidia VP of Solutions Architecture and Engineering) - GPU Accelerated Machine Learning

Dr. Michael Rosenfield (IBM VP Data Centric Solutions) - Future Computing Systems

Stan Reiss (Matrix Partners) - Brilliant Technologists Building Cool Stuff

Prof. Julian Shun (MIT CSAIL) - Large-Scale Graph Processing

Mark Hamilton (Microsoft) - Microsoft MLSpark: Unifying Machine Learning Ecosystems at Massive Scales

Jaya Shankar (Mathworks) - Deploying High-Performance Deep Learning Applications

Prof. Yunsi Fei (Northeastern University) - Evaluating Fault Resilience of Compressed Deep Neural Networks

Dr. Robert Freeman (Director, Research Technology Operations, Harvard Business School)

Julie Ma (Project Leader, Northeast Cyberteam Initiative, MGHPCC)

Tutorials:

Introduction to SPIRAL; organizers: Franz Franchetti (CMU), Tze Meng Low (CMU), Mike Franusich (SpiralGen, Inc)

Security Design of Mission-Critical Embedded Systems; organizers: Dr. Michael Vai (MIT LL)

Computational Machine Learning 101; organizer: Prof. Raj Rao (University of Michigan)

Building graph algorithms with the GraphBLAS; organizers: Dr. Timothy Mattson (Intel); Dr. Scott McMillan (CMU SEI);

Dr. Aydin Buluc (LBNL); Dr. José Moreira (IBM); Carl Yang (UC Davis)

Mathematics of Big Data & Machine Learning; organizer: Dr. Jeremy Kepner (MIT LLSC)

A Quantum Computing Primer with Sample Programming Exercises; organizer: Prof. Patrick Dreher (NC State Univ)

IEEE-HPEC.ORG



2019 IEEE International Symposium on Technologies for Homeland Security

information@ieee-hst.org

November 5 - 6, 2019 Woburn, MA USA

MARK YOUR CALENDAR!

**HST Symposium Coming
5 – 6 November 2019**

The 19th annual IEEE Symposium on Technologies for Homeland Security (HST '19),

will be held

5 - 6 November, 2019

in Woburn MA USA.

This symposium brings together innovators from leading academic, industry and business, Homeland Security Centers of Excellence, and government programs to provide a forum to discuss ideas, concepts, and experimental results.

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



Humanitarian Assistance & Disaster Relief



Land/Maritime Borders & Critical Infrastructure Protection



Biometrics & Forensics



Cyber Security



Frontier and Emerging Technologies

See IEEE-HST.ORG for more details or [click here](#) to join the 2019 HST mailing list for up-to-date news!

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 ,
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Fundamental Mathematics Concepts Relating to Electromagnetics

Full course description and registration at ,
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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/>

IEEE Blockchain Event – 6:00PM, Tuesday, August 6

Inaugural Meeting

In our inaugural meeting, we'll discuss IEEE Blockchain (<http://blockchain.ieee.org>) group that works on standards and education and plans our local Blockchain group in Boston.

Then the founder of LedgeSafe, (<https://ledger-safe.com/about>) will present their startup company.

Pizza will be served!

Meeting Location: 105 Massachusetts Ave, Cambridge, MA

We are in the VON HIPPEL ROOM (13-2137) which is pictured here,
<https://mitcmse.mit.edu/building-13-resources/conference-rooms>

Call for Articles

Now that the Reflector is all electronic, we are expanding the content the publication. One of the new features we will be adding are technical and professional development articles of interest 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 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 articles will be reviewed by the publications committee for suitability. The author will be notified of the reviewers' decision.

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

We are excited about this new feature and hope you are eager to participate!

Submissions should be sent to;
ieeebostonsection@gmail.com

Call for Course Speakers/Organizers

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

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

The Boston Section is one of the largest and most technically diverse sections of the IEEE. We have over 20 active chapters and affinity groups.

If you have an expertise that you feel might be of interest to our members, please submit that to our online course proposal form on the section's website (www.ieeeboston.org) and click on the course proposal link (direct course proposal form link is

<http://ieeeboston.org/course-proposals/> .

Alternatively, you may contact the IEEE Boston Section office at ieeebostonsection@gmail.com or 781 245 5405.

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

IEEE Boston Section Social Media Links:

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find out more at urtc.mit.edu

2019 MIT IEEE Undergraduate Research Technology Conference

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3 Days of Keynotes, Technical Sessions & Workshops/ Product Demos



SPEAKERS



Joe Madden



Mike Violette



Anil Pandey



Caroline Chan



Eli Brookner



Eric Bogatin



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Shalom-Shlomi
Zigdon



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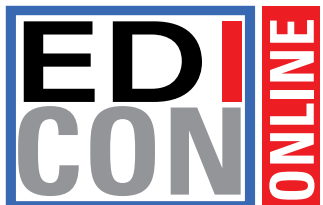
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www.edicononline.com
September 10-12, 2019

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Python Applications for Digital Design and Signal Processing

(14.5 hours of instruction!)

Time & Date: 8:30AM - 5:00PM, Thursday & Friday, September 26 & 27
Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA
Speaker: Dan Boschen

Course Summary

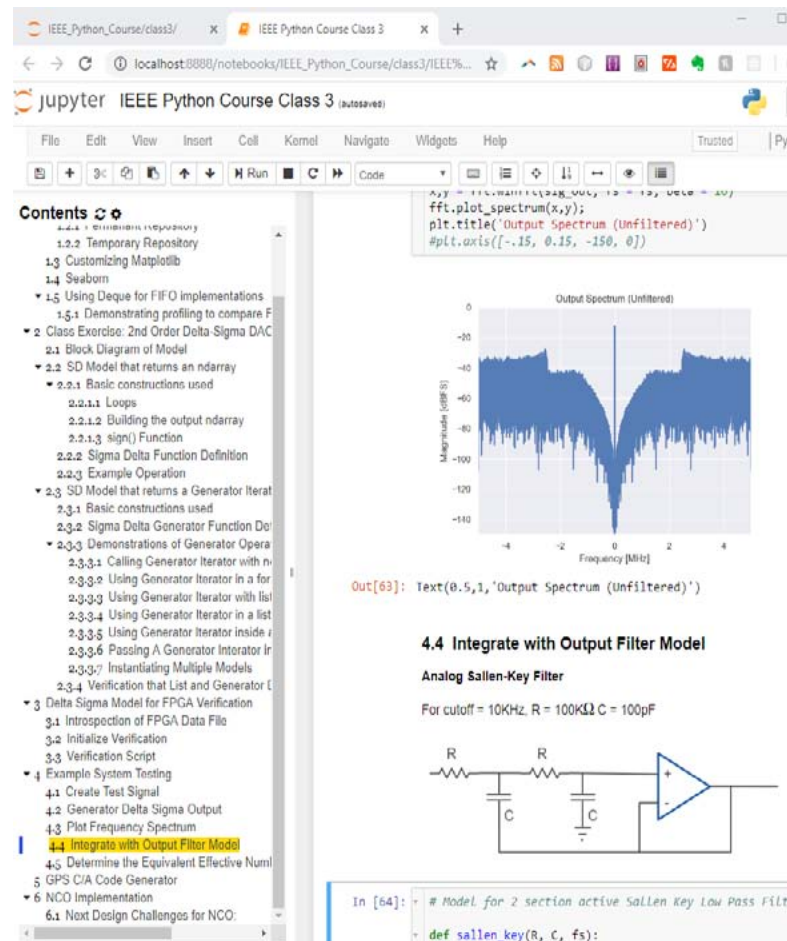
This is a bring-your-own laptop, hands-on course in the popular and powerful open source Python programming language.

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.

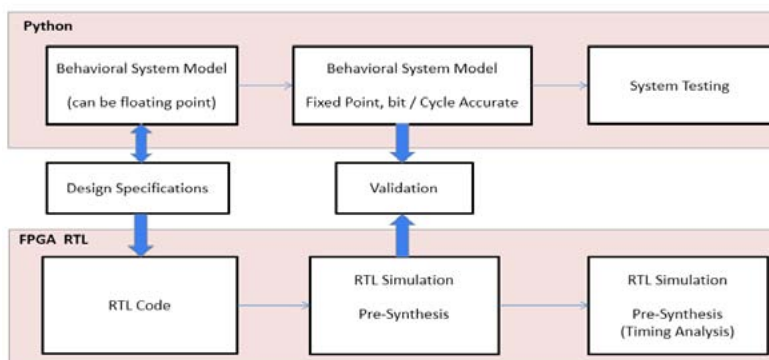


Target Audience: This course is targeted toward users with little to no prior experience in Python, however familiarity with other modern programming languages and an exposure to object-oriented constructs is very helpful. Students should be comfortable with basic signal processing concepts in the frequency 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, September 26

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, September 27

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.

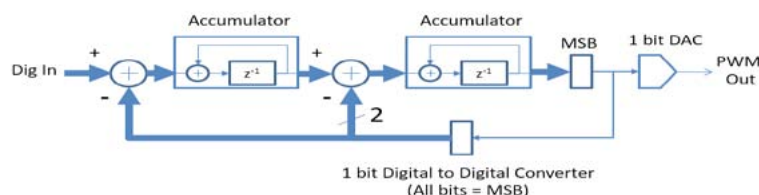
45 minute lunch

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 Monday, September 16

Payment received by September 7

IEEE Members \$450

Non-members \$495

Payment received after September 7

IEEE Members \$515

Non-members \$535

DSP for Wireless Communications

(13 hours of instruction!)

Time & Date: 6:00 - 9:00PM, Tuesdays, October 1, 8, 15, 22 & 29

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”.

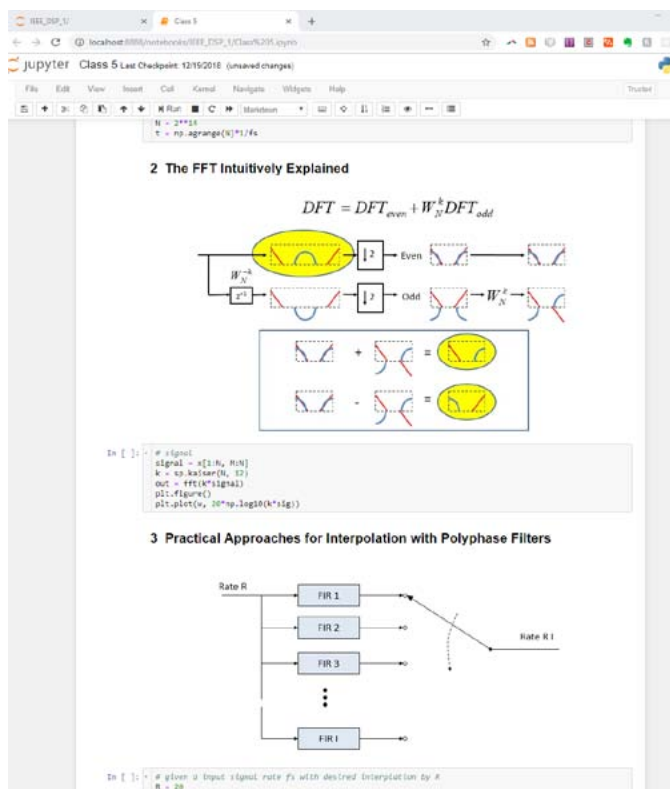
Students will be encouraged but not required to bring a laptop to class, and all set-up information for installation will be provided prior to the start of class.

Target Audience:

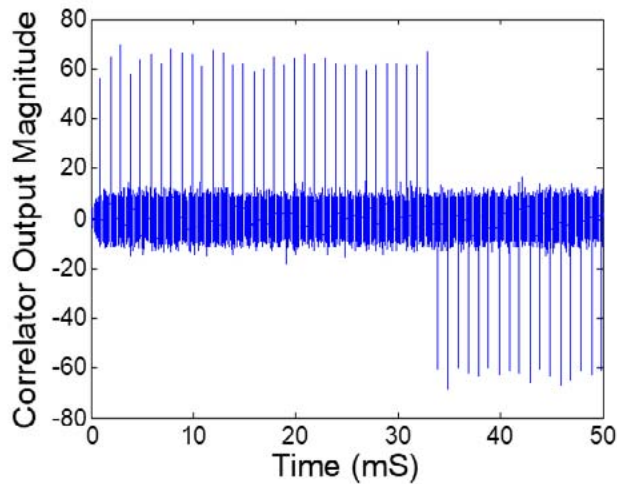
All engineers involved in or interested in signal processing applications. Engineers with significant experience with DSP will also appreciate this opportunity for an in-depth review of the fundamental DSP concepts from a different perspective than that given in a traditional introductory DSP course.

Benefits of Attending/ Goals of Course:

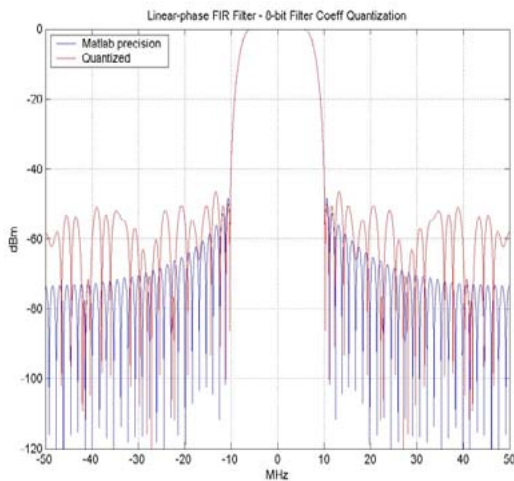
Attendees will build a stronger intuitive understanding of the fundamental signal processing concepts involved with digital filtering and mixed signal analog and digital design. With this, attendees will be able to implement more creative and efficient signal processing architectures in both the analog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



Sliding Correlation



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

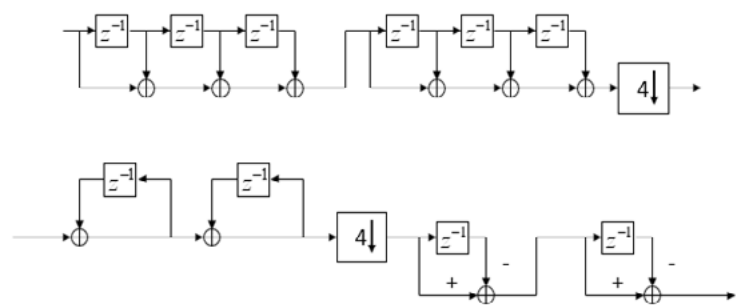


Class 5: Fast Fourier Transform, Multi-rate Signal Processing, Multi-rate Filters

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

Multi-stage CIC



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>

Topics / Schedule:

Class 1: Correlation, Fourier Transform, Laplace Transform

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

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

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

Decision (Run/Cancel) Date for this Courses is Friday, September 27

Payment received by Sept. 19

IEEE Members \$350

Non-members \$385

Payment received after Sept. 19

IEEE Members \$385

Non-members \$420

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

DSP for Software Radio

(13 hours of instruction!)

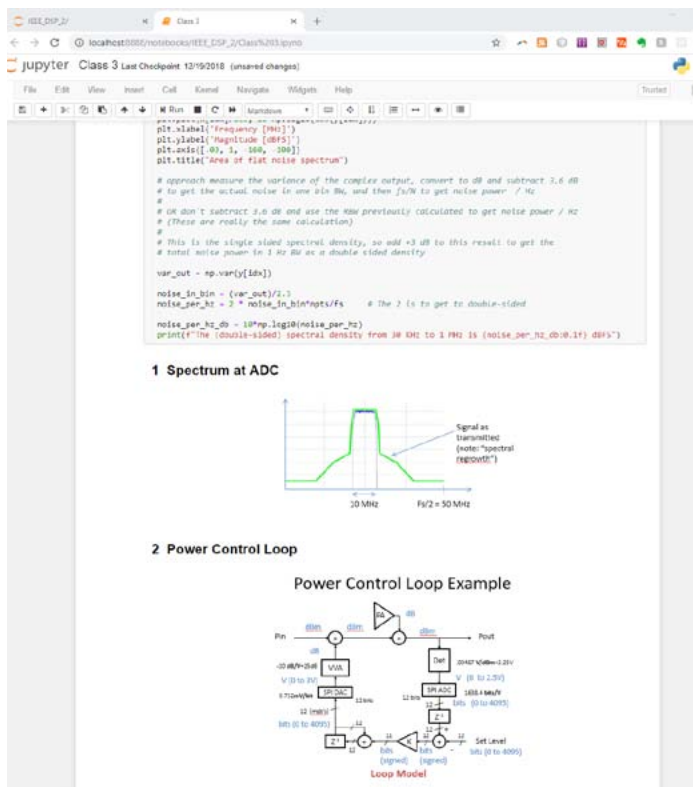
Time & Date: 6:00 - 9:00PM, Wednesdays, Oct. 30, Nov. 6, 13, 20 & Dec. 4

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

Speaker: Dan Boschen

Course Summary

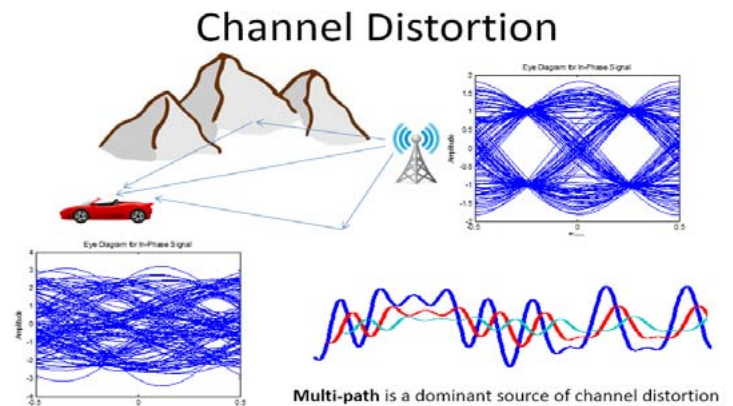
This course builds on the IEEE course “DSP for Wireless Communications” also taught by Dan Boschen, further detailing digital signal processing most applicable to practical real-world problems and applications in radio communication systems. Students need not have taken the prior course if they are familiar 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

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

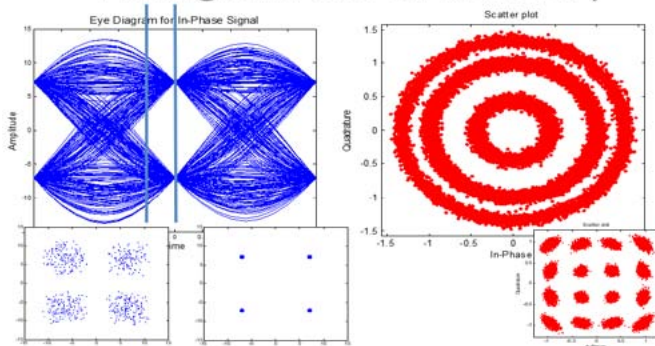
Class 5: RF Signal Impairments, Equalization and Compensation, Linear Feedback Shift Registers

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>

Timing and Carrier Recovery



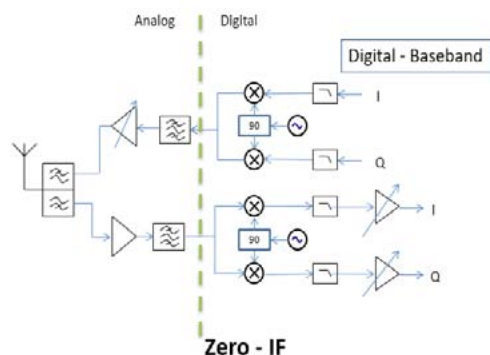
is covered in a separate IEEE Course "Python Applications for Digital Design and Signal Processing".

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,

Radio Architectures



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.

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

Payment received by Oct. 17

IEEE Members	\$340
Non-members	\$375

Payment received after Oct. 17

IEEE Members	\$375
Non-members	\$440