BOSTON

THE REFLECTOR

ISSUE #9
SEPTEMBER 2021

IEEE
Advancing Technology for Humanity

TABLE OF CONTENTS

Engineers are the Unsung Olympians

By Soon Wan, IEEE Boston Section, Student Activities Chair

The 2020 Summer Olympic was officially closed at the Tokyo Olympic Stadium on August 8, 2021. The closing ceremony with tribute videos, firework, and amazing light show celebrated not only the athletes, but also the people, such as the Engineers, Scientists, and Volunteers, behind the Games.

I watched the Olympic Games, including the opening and closing ceremonies, and I noticed advanced technologies were used extensively that not only made the world sports event very successful, but also had helped the athletes to be Olympians and won the medals. Just to list a few, below are examples on how technology was used at the Games.

At every Olympic Games, as far back as I could remember, there was a mascot made of fluffy materials. For the Tokyo Olympics, the Engineers at Toyota developed the mechanical robot mascots - Miraitowa and Somelty. They are the Games' ambassadors to symbolize the spirit of the Olympics and have a vital role to welcome athletes and visitors from around the world. They have the technology that enables them to dance and interact with people.

On the live TV streaming, I saw Human Support Robots showed people to their seats. Delivery Support Robots delivered food to spectators who ordered from a dedicated tablet. And, the most impressive, the Field Support Robots delivered and retrieved items from the field of play, when I watched the track and field events. Later I learnt that all these robots were developed by the Engineers at Toyota.

In addition to the robots, Toyota also deployed about one hundred autonomous vehicles to transport items, athletes and visitors between the airport, Olympic Village and event sites. The Engineers had built all these robots with the game-changing technology to ease the life of the Olympians and Volunteers at the Games.

Engineers and Scientists have also developed technologies that have revolutionized the sports training. The advanced technologies have become smaller in size, more resilient, and less burdensome. Hence, they enable the opportunity to live-tracking and analyze the athletes' performance. The wearable sensors on the athletes can transmit the real-time information to their trainer's portable devices. Engineers at Intel have developed the technology to process data from normal cameras to capture the motions of an athlete, and then analyze the biomechanics of his or her movements.

These technologies not only helped athletes train, but also how the audience, like me, could experience the Olympic Games. For example, when I watched the live swimming events, I could virtually feel how fast the Olympians swam, as the speed of the swimmers was displayed on the TV screen, and it tracked with the swimmers to the finish line. Then, in less than a second, the result of Gold, Silver and Bronze winners, and the times, showed on the screen.

Another advanced technology used at the Olympic Games was the timing. The Games really needed the timer technology that could record one-hundredth of a second of a swimmer in the pool, and the 100-meter sprinter on the track. The timing system included a laser projected at the finish line, and integrated the starting gun mimic sound. The system also included the high speed video camera technology to avoid discrepancies. I believe many of these Engineers and Scientists are IEEE members, and their membership has helped their research and development of many of these technologies for the Olympic Games.

In my opinion, IEEE and its members are not only advancing technology for humanity, but also for the Olympic Games. They are inspiring a global sport community through highly-cited publications, conferences, technology standards, and professional and educational activities.

To conclude, all Engineers and Scientists, including the IEEE Members, who have contributed to help the athletes to become Olympians and made the Olympic Games a successful, are the unsung Olympians. They should be recognized with the Gold medal.

IEEE Boston Section Volunteer Raffle Winner!

The IEEE Boston Section held its annual "Leadership Forum" on June 15, 2021. All the Boston Chapter and Affinity Group leaders who attended the meeting were entered into a raffle for an Apple iwatch. This year's raffle winner is Aakask Deliwala, Chair of the Boston Consumer Technology Chapter. Congratulations, Aakash!

There will be a leadership forum planned in 2022 and all eligible local volunteers will be invited and are encouraged to attend the event to be entered into a similar raffle in 2022.

Call for Articles

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

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

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

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

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

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

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

Electronic Reliability Tutorial Series - (Fall 2020)
Full course description and registration at ,
http://ieeeboston.org/electronic-reliability/

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

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

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

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

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

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

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

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

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

CALL FOR IEEE BOSTON SECTION AWARDS NOMINATIONS (2021)

DISTINGUISHED SERVICE AWARD

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

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

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

DISTINGUISHED MEMBER AWARD

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

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

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

STUDENT ACHIEVEMENT AWARD

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

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

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

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

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

Consumer Technology Society
Call for Volunteers!

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

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

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

Aakash Deliwala, Chair, IEEE Boston Consumer Technology Chapter

Engineering in Medicine & Biology Society
Call for Volunteers!

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

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

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

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

IEEE Video Series

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

Among the programs they've produced include "Electric Vehicles: Fun Saving Our Planet", "Greener Power For More Electric Vehicles", "Overcoming Nuclear Fears To Achieve Net Zero CO_2 By 2050" and "Achieving a Net Zero Carbon Future", and "Green Energy's Economic Progress". Projects currently in production include the expansive topic of futurology, with a focus on increasing the efficiency and transformation of aging electrical power generating stations and infrastructure to accommodate nuclear power; reviewing the viability of alternative energy (such as geothermal, wind and solar); and focusing on 'cleaner' fossil fuels that are more environmentally-friendly to slow the rate of climate change.

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

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

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

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

Call for Course Speakers/Organizers

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

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

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

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

MIT URTC 2021   10/8 - 10/10, 2021
UNDERGRADUATE RESEARCH TECHNOLOGY CONFERENCE

IN PARTNERSHIP WITH **IEEE** **MIT**

Passionate about research in technology? Looking to share your work with peers and professionals?

Join us at MIT URTC 2021!

PAPERS

EARLY SUBMISSION DEADLINE	JULY 11, 2021
EARLY NOTIFICATION OF ACCEPTANCE	JULY 31, 2021
REGULAR SUBMISSION DEADLINE	JULY 31, 2021
REGULAR NOTIFICATION OF ACCEPTANCE	AUGUST 21, 2021

POSTERS & LIGHTNING TALKS

SUBMISSION DEADLINE	AUGUST 29, 2021
NOTIFICATION OF ACCEPTANCE	SEPTEMBER 5, 2021

CONFERENCE DATES
10/8 - 10/10, 2021

Technical Tracks

1. **Biological and Biomedical Engineering (BioEECS)**
2. **Circuits, Materials, and Nanotechnologies**
3. **Computer Systems, Theoretical Computer Science and Mathematics**
4. **Machine Learning / Artificial Intelligence (AI)**
5. **Robotics and Controls**
6. **Security and Communications**
7. **Space Application and Technologies**
8. **Innovation Research**

Submission Site:
https://cmt3.research.microsoft.com/URTC2021

Entrepreneur's Network – 5:30PM, Tuesday, September 7

Pressure – Test Your Startup Idea

Main Event begins at 7:00PM EDT
Online Networking begins at 5:30PM

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

Register Here: https://boston-enet.org/event-3892682

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

Pressure testing is a 360-degree check of a business strategy or plan that reveals blind spots within the organization and assumptions that may be held by members of the team. It is a stress test to evaluate plans before committing resources into action to identify risks and opportunities. One of the biggest mistakes made by startup company founders and entrepreneurs: charging in with an inadequate understanding both of the problem they want to address and the practicability of the solution they have in mind.

Among the rigorous "pressure tests" that can be applied to the entrepreneurial idea, are the following:

Defining the business need or problem and articulating the revenue-generating solution,
Developing a qualified advisory group,
Defining and segmenting a target population,
Identifying the most competitive alternative, and
Addressing operating realities.

At the end of each test the entrepreneur and team seek to issues and to thus spot early and inexpensively those ideas that aren't worth pursuing. Successful pressure testing can save a startup company a lot of money and potentially save the founder and entrepreneur form a lost opportunity and an unsuccessful ventures.

This is all part of our topic for the evening "Pressure – Test your Startup Idea." The discussion will also include how pressure testing is done in different entrepreneurial settings, and from different viewpoints. Our first speaker is an accomplished scientist and life science C-level executive and entrepreneurs, who will discuss pressure testing in STEM-based entrepreneurship. Our second speaker, a consultant, author, and company founder, will approach pressure testing as part of her strategies for digital transformation, product marketing, business processes, and branding. She will also emphasize the importance of having the right people within the startup (and circle of advisers) to conduct a pressure test. Our third and final speaker, with offer the viewpoint of the angel investor which is important for founders and entrepreneurs to know as you may be right now or later be seeking angel investment to grow your startup company. Our third speaker who is co-chair of an important Massachusetts focused angel fund and chair-emeritus of the angel investors association will speak about pressure testing from the viewpoint of the investor, its relevance, benefits and importance for a startup that wants to gain angel investment. The panel will be moderated by ENET Chair Emeritus Rob Adelson.

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

Agenda:
5:30 – 6:45 – Networking on Zoom
7:00 - 7:10 PM - ENET Chairperson's announcements
7:10 - 7:25 PM – eMinute Pitch - Up to 3 Startup companies' presentations
7:25 - 8:10 PM - expert speakers on the night's topic
8:10 - 8:30 PM – Moderator and Audience Q & A with the speakers
8:30 – 9:00 PM - Networking on Zoom
(all times are USA Eastern Daylight time)

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

Register Here: https://boston-enet.org/event-3892682

Speakers:

Joyonna Gamble-George, Ph.D.

COO & Chief Scientific and Medical Officer @ SciX, LLC, a biotech Internet of Things software applications and device development company searching for data science-based methods to combat brain disorders and other health issues. Her business acumen and advocacy for STEM-based entrepreneurship was honored with the Entrepreneur of the Year Award, the Tampa Bay Business Journal's 40 Under 40 Award, and as a finalist for the 2019 Lewis A. Shattuck Small Business Advocate of the Year Award. As an AAAS Science and Technology Policy Fellow, Dr. Gamble-George served as an expert science advisor at the National Institutes of Health for doctors, psychologists, nurses, and other scientists all across the United States that conduct implementation science research on chronic diseases and mental health in vulnerable populations, such as people living with HIV. In her work, she has also implemented community-based initiatives in rural communities to combat infectious and chronic diseases due to her passion to promote public health in populations impacted by health disparities. Dr. Gamble-George holds a Bachelor of Science in Biochemistry and Biology with Honors in Mathematics from Xavier University of Louisiana, a Master of Health Administration from the University of South Florida College of Public Health, and a Ph.D. in Neuroscience from Vanderbilt University.

https://speaker.innovationwomen.com/users/4057
https://www.linkedin.com/in/joyonnagamble/

David L. Verrill, Founder/Managing Director   @ Hub Angels Investment Group, Chair Emeritus @ Angel Capital Association.

The Hub Angels began meeting in March 2000 with the notion of matching active, early stage investors with technology-driven, start-up companies.   Location preference for Massachusetts, but also the Northeastern states and Eastern Canada. Investment: $250K - $750K purchase of preferred equity, (far) less than $10 million pre-money valuation, board representation, active investors. Hub Angels currently manages a portfolio of more than 40 companies across six funds. The Hub funds and Members have invested more than $40 million in a broad range of sectors including Mobile/ Media, Internet/Web Services, Software, Life Sciences, and Electronics/Industrial. David's professional career began as a research scientist at the Center for Blood Research in Boston focusing on the MHC of genetically engineered mice. After receiving his master's degree from Sloan in 1987, he spent a decade at MIT raising capital from industry and facilitating technology transfer. David still holds a partial appointment at the MIT Initiative on the Digital Economy. In 1996 he joined Xerox as Manager of International Sales and Business Development for the Adaptive Products Division before it was sold. In 1998 David joined third party marketing firm Winchester International Group as Managing Director. In 2000 Winchester helped found the Hub Angels, an early stage investment group in Boston. David sits on the Boards of several Hub portfolio companies, and is Chair Emeritus of the Angel Capital Association. David was educated at Bowdoin College and the MIT Sloan School of Management.

https://www.linkedin.com/in/davidverrill/
http://www.hubangels.com/about.html

Mary Brodie, Digital Transformation & Customer Experience Strategist, Founder @ Gearmark. Her main work is as a senior business and marketing consultant with 15+ years of experience working with leaders and executives – from startups to Fortune 500s – to translate their corporate vision into compelling strategies and actionable plans. She has strong expertise in customer experience, particularly creating cohesive strategies for digital transformation, product marketing, business processes, and branding that result in successful launches, increased product adoption, lead generation, and revenue growth.

As founder of Gearmark, Mary has been helping companies create memorable customer experiences, online and offline, for over 20 years. From apps to content strategy to lead gen programs, Mary has helped companies achieve results that contribute to the bottom line. Mary is author of Revenue or Relationships? Win Both - https://www.revenueorrelationships.com/ She is an Adjunct Lead Digital Marketing Instructor at Kansas State University, and a graduate of Simmons University with BA and MA degrees.

https://www.linkedin.com/in/mfbrodie/
https://speaker.innovationwomen.com/users/156

Moderator and Chief Organizer
Robert A. Adelson, Principal, Business and Tax attorney @ Adelson & Associates, LLC. 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 Engel & Schultz LLP where he was a partner from 2004 to 2019. When the senior partners retired, he moved his law practice to his own firm, effective 1/1/2020. 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, plus more than thirty articles since 2016 on executive employment topics published by CEOWorld magazine. 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.
https://www.linkedin.com/in/robert-adelson-b8a1557/
www.executiveemploymentattorney.com

FURTHER INFORMATION:
Location: Online Webinar
Register Here:
https://boston-enet.org/event-3892682

Call for Course Speakers/Organizers

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

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

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

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

Computer Society and GBC/ACM – 7:00PM, Thursday, September 9

Implementing Symbols and Rules with Neural Networks

Ellie Pavlick, Brown University/Google AI

Register in advance for this webinar at: https://acm-org.zoom.us/webinar/register/3116263863253/WN_kBPd0z0MR7CDqJy26G-j0Mw. After registering, you will receive a confirmation email containing information about joining the webinar.

Many aspects of human language and reasoning are well explained in terms of symbols and rules. However, state-of-the-art computational models are based on large neural networks which lack explicit symbolic representations of the type frequently used in cognitive theories. One response has been the development of neuro-symbolic models which introduce explicit representations of symbols into neural network architectures or loss functions. In terms of Marr's levels of analysis, such approaches achieve symbolic reasoning at the computational level ("what the system does and why") by introducing symbols and rules at the implementation and algorithmic levels. In this talk, I will consider an alternative: can neural networks (without any explicit symbolic components) nonetheless implement symbolic reasoning at the computational level? I will describe several diagnostic tests of "symbolic" and "rule-governed" behavior and use these tests to analyze neural models of visual and language processing. Our results show that on many counts, neural models appear to encode symbol-like concepts (e.g., conceptual representations that are abstract, systematic, and modular), but not perfectly so. Analysis of the failure cases reveals that future work is needed on methodological tools for analyzing neural networks, as well as refinement of models of hybrid neuro-symbolic reasoning in humans, in order to determine whether neural networks' deviations from the symbolic paradigm

Ellie Pavlick is the Manning Assistant Professor of Computer Science at Brown University and a Research Scientist at Google AI.

Ellie received her PhD in Computer and Information Science from University of Pennsylvania in 2017. In 2012, she received a Bachelor of Arts in Economics from Johns Hopkins University and a Bachelor of Music in Saxophone Performance from the Peabody Conservatory. Ellie's current research is in Natural Language Processing, specifically on computational models of semantics and pragmatics which emulate human inferences. She is interested in building better computational models of natural language semantics and pragmatics: how does language work, and how can we get computers to understand it the way humans do?

This joint meeting of the Boston Chapter of the IEEE Computer Society and GBC/ACM will be online only due to the COVID-19 lockdown.

Up-to-date information about this and other talks is available online at
https://ewh.ieee.org/r1/boston/computer/.
You can sign up to receive updated status information about this talk and informational emails about future talks at https://mailman.mit.edu/mailman/listinfo/ieee-cs, our self-administered mailing list.

Geoscience & Remote Sensing Society – 6:00PM, Thursday, September 9

Simulating the Performance of Ocean-Observing Imaging Payloads for Nanosatellites

Location: Zoom
Speaker: Candence Brea Payne

Earth's oceans are the largest defining feature of our planet and arguably an invaluable resource. Consequences of climate change threaten to have substantial and irreversible negative effects on our oceans, making it crucial to quickly understand and quantify behavioral changes resulting from increased human impact. Near-continuous, large-scale monitoring from space is revolutionizing methods for monitoring and forecasting ocean behavior. Nanosatellite platforms offer a potential solution for large-scale deployment of ocean-sensing instruments that provide detailed measurements of critical characteristics. Monitoring these key features provides valuable insight to behavioral changes within the context of our shifting climate.

Constellations of nanosatellites that target key ocean characteristics could provide continuous ocean monitoring with high spatiotemporal resolution. Compared with current state-of-the-art ocean-observing spacecraft, such as NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) with a repeat cycle of 16 days, nanosatellites in Low-Earth Orbit (LEO) can observe the same ground scene roughly once every five days. While spacecraft such as NASA's Geostationary Operational. Environmental Satellite (GOES) achieves high temporal resolution, imaging the same scene every 30 seconds to 15 minutes depending on target region size, they are limited to imaging a single ground scene due to their stationary placement. Constellations of nanosatellites offer opportunities for measurement improvement including reducing revisit rates down from several days to hours, as well as increasing surface coverage through placement in orbital planes of varying inclinations.

Informative, emergent information such as sea surface salinity, front location, and fauna concentrations (namely phytoplankton) are derived from measuring key characteristics such as ocean color and Sea Surface Temperature (SST). Existing nanosatellite constellations such as Planet's Flock-3p, composed of 88 3U (10 x 10 x 30 cm) CubeSats, provide daily coverage of Earth's land mass; however, they do not yet target oceans and coastal regions, nor tailor their imaging bands for these specific measurement needs. We present a concise set of ocean measurement band centers for an imaging payload targeting ocean color, a key behavioral feature. We assume narrow-band (10 - 15 nm bandwidth) ocean color measurements (390 nm - 865 nm) and constrain the payload to within the volume of a U-class (3U / 6U / 12U) nanosatellite located in LEO (~ 450 km altitude). A radiometric link approach is used to develop a tool that compares the performance of multiple different available Commercial Off-the-Shelf (COTS) detectors, as well as different detector and optical front-end combinations. As detector sensitivity performance is driven primarily by aperture size and focal length, the imaging payload is assumed to have a scalable aperture (e.g. Diameter, focal length) and tunable sensor parameters (e.g., pixel pitch, number of pixels, sensor format). We simulate the sensor's performance primarily by scaling the aperture from 0.5 cm to 20 cm diameter, suitable for 0.5U - 12U CubeSat volumes. Simulation results determine key "cut-off" regions where collected data no longer achieve the desired measured sensitivity of the target feature. A discussion of the radiometric approach, including definition of the measurement and detector parameter trade-space, is provided, along with preliminarily results of the simulated performance.

Cadence Payne is a 4th year PhD student in the department of Aeronautics and Astronautics in the Space Telecommunications, Astronomy, and Radiation Laboratory advised by Dr. Kerri Cahoy. Her research at MIT focuses on technology development for small, Earth-observing spacecraft called CubeSats. She is currently the lead Systems Engineer for the Auroral Emission Radio Observer (AERO), a 3U CubeSat that uses a 4-meter vector sensor antenna to probe low-frequency emission from the Earth's aurora. She is also supporting AEROS, a joint mission with MIT Portugal that collects data for climate and weather monitoring via ocean observations. She graduated from Morehead State University in 2017 with a BS in Space Science and a minor in astronomy.

Register: https://events.vtools.ieee.org/m/265365

Entrepreneur's Network – 5:30PM, Tuesday, September 21

Market Assessment for Entrepreneurs

Main Event starts at: 7:00PM EDT
Online Networking begins at: 5:30PM EDT

ENET is pleased to present this event as an online webinar! Use the link below to pre-register!
Register Here:
https://boston-enet.org/event-4401508/Registration

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

Many exciting new products have multiple applications. To assess new markets, entrepreneurs need to balance multiple considerations such as importance to the customer, market size, ease of sales, development/deployment costs and product differentiation. This session will discuss how experts prioritize these elements of a market assessment and their advice on how to approach a market assessment project. This is intended to guide entrepreneurs in choosing which markets to target first and identify the keys to success as they go to market with their target customers.

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

Agenda:
5:30 – 6:45 – Networking on Zoom
7:00 - 7:10 PM - ENET Chairperson's announcements
7:10 - 7:25 PM – eMinute Pitch - Up to 3 Startup companies' presentations
7:25 - 8:10 PM - expert speakers on the night's topic
8:10 - 8:30 PM – Moderator and Audience Q & A with the speakers
8:30 – 9:00 PM - Networking on Zoom
(all times are USA Eastern Daylight time)

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

Speakers:

John Long, Thought Partner Satoe Solutions, Inc.
John is a results driven, performance focused business management executive with over 14 years of leadership and management experience across a range of organizations, from military and government, to startups and Fortune 100 companies. I have proven leadership skills to lead teams while mentoring and developing peers and subordinates. I am known for deep insight, innovative problem solving, and the ability to quickly hone in on the key issue. I am passionate about bringing innovation to market and creating large scale impact.
https://www.linkedin.com/in/johnglong/#

Bruce Berger, Business Management Consultant
Highly accomplished Senior Executive with over 30 years of direct experience in North America, Europe and Asia; Successful company outcomes in a wide variety of markets and industries; Excels in strategic direction, driving growth, operational excellence, team building, fund raising and Board management in venture backed and publicly traded companies; Adept at accelerating growth through keen strategic focus and execution; Experienced in corporate business development activities leading to successful acquisitions of both hardware and software based companies; Extensive background in start-up, early stage and turnaround situations; Strong leadership and interpersonal skills. Passionate about building businesses and communities.
https://www.linkedin.com/in/bruce-berger2437/

Moderator and Organizer

Peter Kirkwood, Strategy Advisor at InformedHC
Strategy leader with proven ability to accelerate growth with a focus on important triggers/levers from planning to execution.

Experience includes technology, Identity

Protection, Public Security, Biometrics, Video Analytics, Data Privacy and Engineering Software/Healthcare. Builds strong teams and solves complex problems to meet business objectives and customer/client expectations. Leverages excellent interpersonal, analytical and project management skills to drive impact across matrix organizations. Effectively communicates/collaborates across all levels of internal/external stakeholders.

With specialties in:
Market Analysis/Relevancy - Product/Service Lifecycle - Emerging Markets
Business Plan Development - Competitive Analysis - Business Models/Projections

Investment Prioritization - Capability/Resource Analysis - Innovation/Creativity
Problem Resolution - Matrix Influence/Accountability - Executive Communication
Market Trends - Request for Proposal (RFP) - Government Grants/Proposals
Cross-Functional Team Leadership - Financial Analysis - Strategic Campaign Development
https://www.linkedin.com/in/kirkwoodpeter/

FURTHER INFORMATION:
Location: Online Webinar
Register Here:
https://boston-enet.org/event-4401508/Registration

Power & Energy Society – 6:00PM, Tuesday, September 21

Big Data, IoT, Enterprise Data Management and the New Data Requirements of Drones and Robotic Inspection Devices

Speaker: John D. McDonald, P.E., Smart Grid Business Development Leader, Grid Solutions, GE Renewable

This talk begins by discussing key industry/societal trends and their impacts. To realize greater benefits from Intelligent Electronic Devices (IEDs) the two types of data within the IED, operational and non-operational, must be managed differently. The Internet of Things (IoT) and its benefits, and examples of new groups of analytics being developed, will be discussed. The importance of convergence of the Operations Technology and Information Technology groups within a utility is emphasized, and its enablement of enterprise data management. The importance of grid modernization industry standards to facilitate integration and interoperability is critical for success. Lastly, the use of new sources of data - unmanned aerial vehicles (UAVs) and robotics – will be described, available data identified, use of the data shown, and data management principles to be implemented discussed.

For more information:
https://site.ieee.org/boston-pes/

Robotics and Automation Society, Women in Engineering, and Sensors Council –
5:00PM, Thursday, September 23

Sensitive and Robust Tactile Pressure Sensors for Robotic Grippers

Lenore Rasmussen, Ras Labs, Inc.
Ras Labs Synthetic Muscle™ senses pressure and controllably deforms, allowing objects to be gently handled and the force to be controlled.

Current robotic sensing is mainly visual, which is useful up until the point of contact. To understand how an object is being gripped, tactile feedback is needed. Human grasp is gentle yet firm, with tactile touch feedback. Ras Labs makes Synthetic Muscle™, a class of electroactive polymer (EAP) based materials and actuators that sense pressure from gentle touch to high impact, controllably contract and expand at low voltage (battery levels), and attenuate force. The development of this technology towards sensing provides fingertip-like sensors that are able to detect very light pressures down to 0.01 N and even 0.005 N, with a wide pressure range over 50 N. By using these soft yet robust Finger-Tip™ sensors, immediate feedback is generated at the first point of contact. Because these elastomeric pads provide a soft compliant interface, the first point of contact does not apply excessive force, allowing the object to be gently handled and the force applied to the object to be controlled. The sensor also detects changes in pressure location on its surface, i.e., directional glide provided real time feedback, making it possible to detect and prevent slippage. We discuss uses and applications for these sensors and grippers, the machine learning (ML) and artificial intelligence (AI) used for object identification and determination of good grip (position, grip force, no slip, no wobble) for pick-and-place and other applications.

what was available in the marketplace. Her drive to advance prosthetic technology led her to invent Synthetic Muscle™ – electroactive polymers (EAPs) that contract and expand at low voltages and sense pressure, which garnered attention in the robotics community. Dr. Rasmussen is a recognized global leader in the EAP industry with multiple patents and publications, presentations at global conferences, including the SPIE Electroactive Polymers Actuators and Devices (EAPAD) Conferences, Orthotic and Prosthetic Association (AOPA) conferences and world congresses, and robotics meetings and consortia, and multi-media communication, including NASA TV. She holds a PhD in Chemistry, Polymer Chemistry specialty, from Virginia Tech, MS in Biology, Biophysics Specialty, from Purdue University, and double major Bachelor of Science degrees in biochemistry and chemistry from Virginia Tech.

Calum Briggs, MS, Robotics Engineer, in addition to robotics engineering, is our hardware-software integrator and a creative force at Ras Labs. He holds a MS in Robotics Engineering from WPI and double major Bachelor of Science degrees in Electrical and Computer Engineering and Robotics Engineering from WPI.

Lenore Rasmussen, PhD, is the CTO and Founder of Ras Labs, and she is also an adjunct professor at Worcester Polytechnic Institute (WPI), where she created and teaches the graduate course "Smart Materials and Actuators (and Biomimicry)" through the Robotics Engineering Department. Her corporate experience includes Johnson & Johnson. While in grad school at Purdue, a relative suffered a traumatic farm injury, and she investigated prostheses, but was disappointed with

This event will be held jointly In-Person (limited seating, masks required) and on Zoom. Register to select your In-Person or Zoom tickets.

Event URL:
https://www.eventbrite.com/e/sensitive-and-robust-tactile-pressure-sensors-for-robotic-grippers-tickets-168422699829

This event is being jointly hosted by the IEEE-RAS Robotics and Automation Society, IEEE Women in Engineering, and IEEE Sensors Council.

5G The Best Channel Codes:

Polar Codes with MATLAB Applications

Last Notice Before Course Begins, Please Register Now

Web-based Course with live Instructor!

Times & Dates: 10 – 11AM ET, September 14, 16, 21, 23, 28, 30, October 5, 7, 12, 14
Speaker: Orhan Gazi, Cankaya University, Ankara-Turkey
Course Format: Live Webinar, 10, one hour, sessions

Introduction: Forward error correction is a vital process in communication systems. The last channel codes discovered in the research world are the "polar codes" which are adapted to be used in 5G standard. The construction and decoding of polar codes are quite different from the construction and decoding of classical channel nodes. Polar codes are the only codes constructed in a non-trivial manner. The discovery of polar codes can be considered as a breakthrough in coding society. It is clear that future channel codes will follow the logic of polar codes. For this reason, it is critical to learn the encoding and decoding philosophy of the polar codes which is the state of art of the coding world.

Outline of the topics to be covered:
•   Entropy and Mutual Information
•   Philosophy of Polar Codes
•   Generator Matrices of Polar Codes
•   Polar Encoder Structures
•   Recursive Structures for Polar Encoders
•   Channel Splitting and Concept of Channel
            Polarization
•   Split Channels
•   Calculation of Split Channel Capacities
•   Polar Decoding
•   Polar Decoding for Noiseless Transmission
•   Polar Decoding Formulas for Kernel Structure
            for noisy Transmission
•   Successive Cancelation Decoding of Polar Codes
•   Belief Propagation Decoding of Polar Codes
•   Polar Encoders and Decoders in 5G New Radio
            (NR) and Future Channel Codes

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

Benefits of Attending Course:
1) The participant will have an idea about the state of art polar codes.

2) Polar codes are used in 5G standard; the participant can comprehend the polar code used in 5G standard.
3) The participant will learn successive cancelation decoding of polar codes.

Speaker Bio: Prof. Orhan Gazi is the author of the book "Polar Codes. A Non-Trivial Approach to Channel Coding" which can be reached from https://www.springer.com/gp/book/9789811307362

The book is selected by IEEE COMSOC as one of the best readings in polar codes, https://www.comsoc.org/publications/best-readings/polar-coding

Prof. Orhan Gazi is the sole author of 10 books written in electrical engineering subjects. Apart from the polar code book, he is the single author of the books "Information Theory for Electrical Engineers" https://www.springer.com/gp/book/9789811084317 and "Forward Error Correction via Channel Coding" https://www.springer.com/gp/book/9783030333799. The research area of Prof. Orhan Gazi involves "channel coding", and "digital communication subjects". Recently, he focuses on over capacity data transmission using polar codes. He is also interested in practical applications of communication systems involving FPGA devices. He is delivering courses with titles "VHDL circuit design", "interface design using VHDL for FPGA devices" and "system on chip design".

Materials to be included: Lecture slides will be provided.

Decision (Run/Cancel) Date for this Course is Wednesday, September 8, 2021

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

https://ieeeboston.org/event/5g-the-best-channel-codes/?instance_id=3068

Electronic Reliability Tutorial Series -
Fall 2021 Edition - Electronic Reliability Series 3:

How to use Simulation and Modeling techniques to Improve Reliability

Three new, LIVE WEBINAR courses!

Times & Dates: Each session is two hours and starts at 11:00AM ET, Oct 7, 14, 21

Speakers: Dr. Nathan Blattau, Michael Blattau, Nick Kirsch, Dr. Gil Sharon & Tyler Ferris, Ansys

Electronics perform critical functions in every major industry vertical, whether in automotive, aerospace, consumer, medical or industrial segments. With the advent of newer technologies (both at the component and material levels), shrinkage of feature sizes, more stringent environments and sophisticated power requirements, electronics face increasing reliability risks. Supply chain trends have changed over the years from a vertically integrated model to a more geographically diverse supply chain. All these trends have increased reliability risks for companies. However, the cost of reliability assurance activities is often a fraction of the cost of failure, with compounding benefits from conducting these activities early in the design process.

This set of three tutorials will highlight how simulation and modeling can be used to optimize the design, gain assurance of passing qualification tests, and mitigate reliability issues early in the design process.

Session 1) Solder Alloys and Modeling Solder Reliability for Electronic Assemblies

Abstract: Solder provides the structural and electrical connection between a printed wiring board (PWB) and electrical components. Solder is the most common material used for assembling electronics. However, while most materials only experience elastic deformation during use, solder is also one of the few structural materials that is expected to also undergo significant inelastic deformation during its lifetime.

Both elastic and inelastic deformation damages solder,
causing the solder joints to fail, and consequentially the printed circuit assembly to fail. Predicting when the solder joint fails is critical when using solder in harsh use environments. These harsh environments have loads that can come in several forms (i.e., drop/shock, vibration, temperature cycling).

While vibration causes high cycle fatigue of solder, most solder fatigue failures in electronics are thermo-mechanically driven due to temperature cycling which causes significant deformations and stresses due to coefficient of thermal expansion (CTE) mismatches between the PWB and components. To predict solder failure, a damage model must be used that relates deformation of the solder to cycles to printed circuit board assembly failure.

In this tutorial, we will discuss material characterization of various solder alloys, predictive solder fatigue damage models using a physics-of-failure approach (PoF) for printed circuit board assemblies and how to develop damage models using simulation and test*ing.*

Target audience: Engineers involved in the design, simulation and modeling, manufacturing and/or reliability of complex printed circuit board assemblies.
 Benefits of attending
•   Learn about different solder alloys and their failure mechanisms
•   Characterizing solder material properties for simulation and modeling
•   Methods for predicting reliability of electronic assemblies

Dr. Nathan Blattau, Distinguished Engineer at Ansys, has been involved in the simulation and reliability of electronic equipment for over twenty years. Prior to joining Ansys, Dr. Blattau was the Vice President and Chief Scientist of DfR Solutions. He holds two patents and has authored over 20 papers and has presented on a wide variety of reliability issues within the electronics industry. His specialties include best practices in design for reliability, robustness of Pb-free, failure analysis, accelerated test plan development, nonlinear finite element analysis, and solder joint reliability. Dr. Blattau holds a Ph.D. in Mechanical Engineering, an M.S. in Mechanical Engineering, and a B.S. in Civil Engineering from the University of Maryland

Session 2) Printed Circuit Board Level Reliability Testing – Leveraging Testing, Failure Analysis, and Simulation to Improve Reliability

Abstract: Board Level Reliability Testing (BLRT) encompasses a range of environmental stress tests that evaluate the robustness of a semiconductor package once soldered to a printed circuit board (PCB). Solder joint reliability under thermal and mechanical loads has been the focus of BLRT programs, though increasingly other failure modes have also been identified for testing under these programs. While standards from organizations, such as JEDEC JEP150 and AEC Q104 (for automotive), provide guidance for BLRT testing, there is often ambiguity around test coupon design, test conditions, test duration, and failure criteria. This ambiguity can cause confusion, delay, and dissatisfaction up and down the supply chain.

Additionally, finite element modeling (FEM) is often underutilized in BLRT programs. Proactive simulation can be a helpful tool to design for reliability and improve overall BLRT robustness. This tutorial will cover tips for designing an appropriate BLRT program. This includes best practices in BLRT risk assessment, test coupon design, and experimental procedures. It will also review how to leverage simulation to improve BLRT design and performance.

Target audience: Engineers involved in the design, prototyping, qualification, or end use of new electronic package designs

Benefits of attending
•	Learn about common failure modes and mechanisms of electronic package assemblies experienced and tested for in Printed Circuit Board Reliability Testing
•	Learn about best practices for designing and conducting a board level reliability test program (BLRT)
•	Learn how to use simulation to predict qualification test performance and reduce design cycles

Michael Blattau is a Senior Consulting Engineer at Ansys with expertise in mechanical packaging of electronics. Prior to working for Ansys he was a Design Engineering Supervisor for over a decade with an embedded computer manufacturer. Michael brings significant expertise in electronics enclosure design, PCB layout, and FEA simulation and has a M.S., Electronic Packaging.

Nick Kirsch (MBA, PMP) leads the modeling and simulation team for ANSYS Reliability Engineering Services. He has a 9-year background as a project manager and engineer working with US Government and private sector clients to improve product performance, resolve manufacturing problems, manage complex testing programs, and provide expert analysis and guidance at all stages of the product development process. At ANSYS, his work focuses on validating and improving the mechanical performance of electronics systems through testing and FEA reliability simulations.

Session 3) Simulation Techniques to Evaluate ELK Stress During Chip Attach Process and Mitigate Failures

Abstract: Electronic component manufacturing requires a technology to connect a silicon die to a circuit. A popular method to do so is to flip the die and solder it using C4 bumps to a substrate. The substrate is then finished into a component. A major concern for flip chip technology nsion of the silicon die (2-3 ppm/°C) and the substrate (8-15 ppm/°C). The stress in the extreme low-k layers (ELK Stress) causes a brittle fracture).

This workshop is a hands-on tutorial on completing a simulation for this failure mode. The tutorial includes example files, analysis settings and best-known methods. The workshop will rely on the use of Ansys Sherlock, Ansys Mechanical and Ansys SpaceClaim inside the Ansys Workbench environment.

Target audience: Flip chip component designers and integrators, assembly bumping designers and manufacturers, chip attach, packaging and assembly engineers

Benefits of attending
- How to prevent flip Chip packaging and assembly issues
- Prevent ELK cracking problems before design
- Using simulation techniques to drive design for manufacturing (DfM)

Dr. Sharon is a diverse industry expert with research specialties including mechanical reliability of electronic systems and characterization; embedded components failure analysis and particle beam accelerator mechanical fatigue; multidisciplinary reliability of complex electromechanical systems; characterization and modeling of material behavior; mechanical performance of flip chip packages; and Physics of Failure of electromechanical and MEMS systems. In addition to his responsibilities at ANSYS - DfR, Dr. Sharon serves as an adjunct faculty member at the University of Maryland.

Tyler Ferris is a Senior Consulting Engineer at Ansys and is an expert in the use of reliability physics, finite element analysis and hands-on laboratory failure analysis. Tyler has consulted with customers in the aerospace, automotive, industrial controls, data center industries and more, to evaluate system, PCBA and component-level failure risks and mitigation strategies.

- Benefits of attending
- How to prevent flip Chip packaging and assembly issues
- Prevent ELK cracking problems before design
- Using simulation techniques to drive design for manufacturing (DfM)

Decision (Run/Cancel) Date for this Course is One week prior to session

Each session is a separate registration

IEEE Members - $80

Non-members - $100

https://ieeeboston.org/event/electronic-reliability-tutorial-series-3/?instance_id=3120

IEEE Boston Section Social Media Links:

Twitter: https://twitter.com/ieeeboston

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

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

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

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

Web-based Course with live Instructor!

Times & Dates: 9AM - 12:30PM ET, Saturday, September 18

Speaker: CL Kim

Course Format: Live Webinar, 3 hours of instruction!

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Decision (Run/Cancel) Date for this Course is Tuesday, September 14, 2021

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

https://ieeeboston.org/event/neuralnetworks/?instance_id=3049

Call for Course Speakers/Organizers

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

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

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

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

Python Applications for Digital Design and Signal Processing

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

Speaker: **Dan Boschen**

Location: **Zoom**

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

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

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

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

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

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

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

Benefits of Attending / Goals of Course: Attendees will gain an overall appreciation of using Python and quickly get up to speed in best practice use of Python and related tools specific to modeling and simulation for signal processing analysis and design.

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

Topics / Schedule:

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

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

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

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

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

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

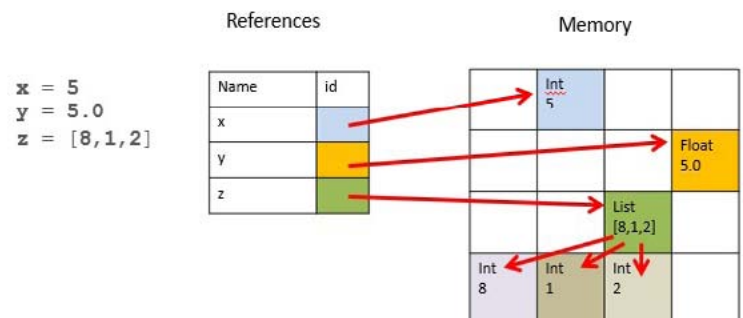For more background information, please view Dan's Linked-In page (https://www.linkedin.com/in/dan-boschen/)

Decision (Run/Cancel) Date for this Course is Thursday, November 4, 2021
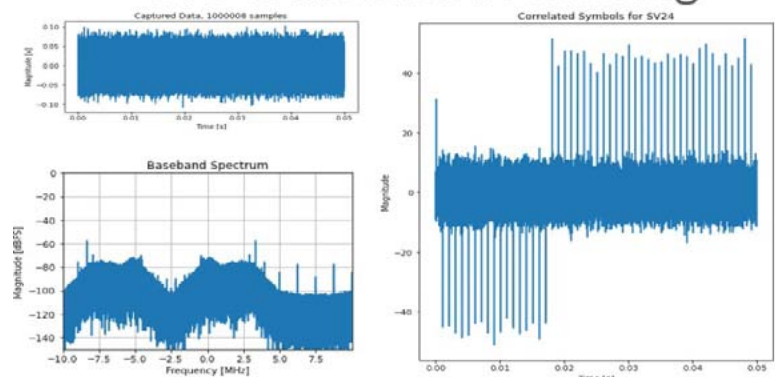
IEEE Members	$190
Non-members	$210

Spyder IDE
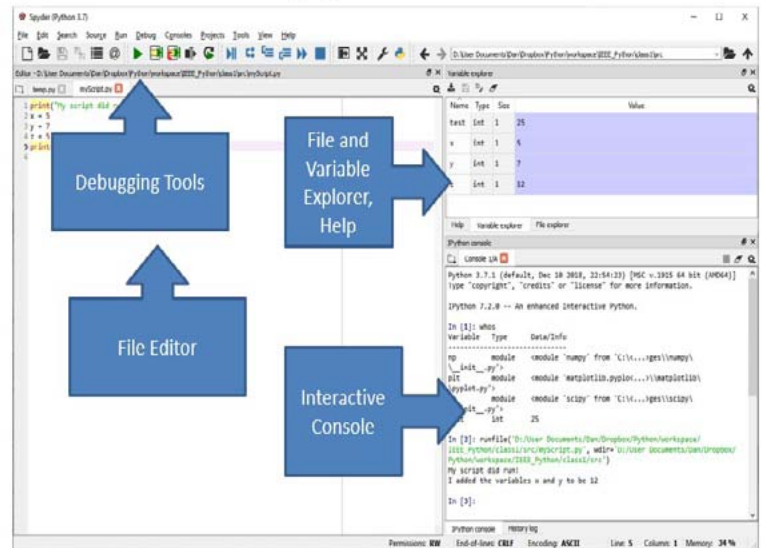
Mutable / Immutable

GPS Waveform Processing

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

Digital Signal Processing (DSP) for Software Radio

Dates & Times: Thursday, October 7, 2021, Videos released weekly 2x1.5 hours
Live Workshops: 7:00 - 8:00PM ET; Tuesdays, October 12, 19, 26, November 2, 9

Speaker: Dan Boschen

Location: Zoom

New Format Combining Live Workshops with Pre-recorded Video

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

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

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

Dan builds an intuitive understanding of the underlying mathematics through the use of graphics, visual demonstrations, and real-world applications for mixed signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges, rather than a tutorial on implementations with DSP processors.

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

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

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

Target Audience: All engineers involved in or interested in signal processing for wireless communications. Students should have either taken the earlier course "DSP for Wireless Communications" or have been sufficiently exposed to basic signal processing concepts such as Fourier, Laplace, and Z-transforms, Digital filter (FIR/IIR) structures, and representation of complex digital and analog signals in the time and frequency 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
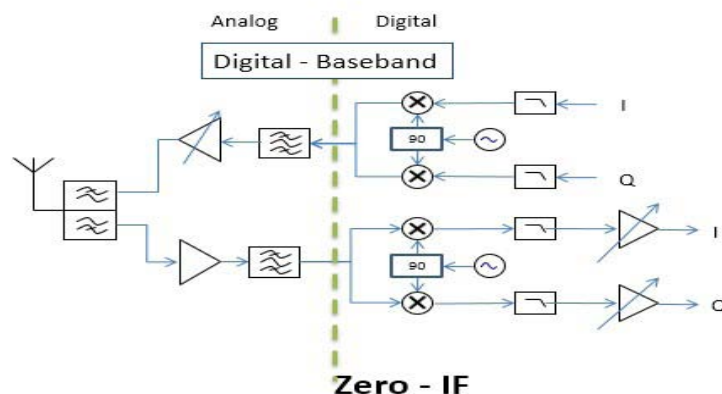
Class 5: RF Signal Impairments, Equalization and Compensation, Linear Feedback Shift Registers

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 and has taught courses on DSP to international audiences for over 15 years. Dan is a contributor to Signal Processing Stack Exchange https://dsp.stackexchange.com/, and is currently at Microchip (formerly Microsemi and Symmetricom) leading design efforts for advanced frequency and time solutions.

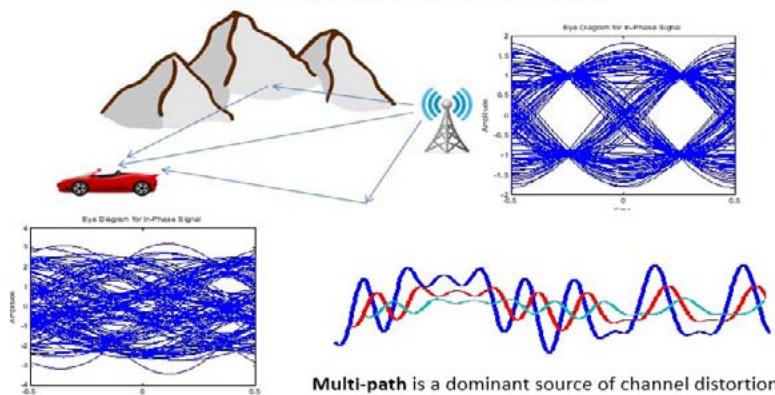For more background information, please view Dan's Linked-In page at: http://www.linkedin.com/in/dan-boschen

Radio Architectures

Timing and Carrier Recovery
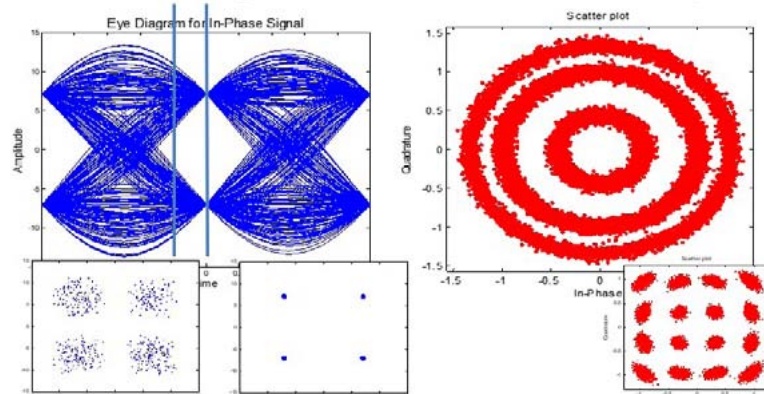
Channel Distortion

Multi-path is a dominant source of channel distortion

Decision (Run/Cancel) Date for this Course is Thursday, September 30, 2021

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

https://ieeeboston.org/event/dspswradio/?instance_id=3098

CALL FOR PAPERS

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

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

IEEE BOSTON SECTION

Sponsors

Platinum

MITRE

Technical Co-sponsors

MTT-S

AESS

APS

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

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

See webpage for more details

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

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

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

Conference Committee

Conference Chair:
Sean Duffy, MIT LL

Vice Chair:
Wajih Elsallal, MITRE

Technical Program Chair:
David Mooradd, MIT LL

Technical Program Vice Chair:
Glenn Hopkins, GTRI

Special Sessions Chairs:
Matt Facchine, NGC
Kenneth E. Kolodziej, MIT LL

Plenary Session Chairs:
Dan Culkin, NGC
Ellen Ferraro, Raytheon

Tutorials Chairs:
TBD
Will Moulder, MIT LL

Student Program Chairs:
Justin Kasemodel, Raytheon
Matilda Livradaru, STR

Sponsorship/ Exhibits Chairs:
Mark McClure, STR
Marc Angelucci, Lockheed Martin

Publicity Chairs:
Bradley T. Perry, MIT LL
Cara Yang Kataria, MIT LL

Social Media Chair:
Elizabeth Kowalski, MIT LL

Publications Chairs:
Raoul Ouedraogo, MIT LL
Steve Best, MegaWave Corp.

Poster Sessions Chair:
Honglei Chen, The MathWorks

Local Arrangements/Finance:
Robert Alongi, IEEE Boston

Website:
Pierre Dufilie, MIT LL
Kathleen Ballos, Ballos Associates

Advisors:
Alan J. Fenn, MIT LL
Jeffrey S. Herd, MIT LL
Eli Brookner, Raytheon (retired)
William Weedon, Applied Radar
Glenn Meurer, MITRE

Primary Sponsor:
IEEE Boston Section

Modern Applications of RISC-V CPU Design

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

Access Period: September 1 - 30, 2021

Speaker: Steve Hoover, Redwood, EDA

Type of Course: Self-paced, on-demand Course. Lab format

Course Overview: CPUs are a fundamental building block of complex SoCs, and RISC-V is taking hold as the ISA of choice. In this workshop, you will create a Verilog RISC-V CPU from scratch, and you will modify this CPU to be suitable for different applications.

You will learn and use modern techniques, using Transaction-Level Verilog to generate and modify your Verilog code more reliably, in far less time. You will discover how concepts like pipelining and hazards can be incorporated easily using timing-abstract design principles. All labs will be completed online in the Makerchip.com IDE for open-source circuit design. The skills you learn will be applicable far beyond CPU design.

Outline of Topics to be Covered:
Digital logic using TL-Verilog and Makerchip
– combinational logic
– sequential logic
– pipelined logic
– validity
– a calculator circuit
Basic RISC-V CPU microarchitecture
– single-cycle CPU microarchitecture
– testbench, test program, and lab setup for your CPU
– fetch, decode, and execute logic for RISC-V subset
– control flow logic
Pipelined RISC-V subset CPU microarchitecture
– simple pipelining of the CPU
– hazards and PC redirects
Completing the RISC-V CPU
– data memory and load/store
– remaining RISC-V (RV32I) instructions

Course Format:
– self paced, on demand course, providing attendees a flexible schedule

– access to content for 30 days
– pre-scheduled live Zoom and chat sessions with the instructors during the 30 day access period
– offline chat available with instructors during the entire 30 day access period (reply within 24 hours).

Target Audience: Engineers interested in a career in digital logic design or adjacent disciplines, including experienced engineers looking to modernize their skill set.

Prerequisites: An engineering education and basic understanding of digital logic. (Verilog knowledge is not a prerequisite.)

Benefits of Attending:
– Develop a solidified understanding of pipelined CPU design through hands-on labs.
– Acquire knowledge of advanced digital circuit design methodology.
– Gain exposure to an open-source design ecosystem.

Speaker Bio: Steve Hoover is the founder of Redwood EDA, an early-stage startup focused on advanced silicon design methodology and tools. Steve is a former logic design lead for DEC, Compaq, and Intel and has extensive experience designing high-performance server CPUs and network switches.

System Requirements: All resources are free and online; no download or installation required. We will use Slack, Zoom, GitHub Classroom, and Makerchip.com.

Decision (Run/Cancel) Date for this Course is Wednesday, August, 25, 2021

	Before August 15	August 15 or later
IEEE Members	$275	$350
Non-members	$320	$395

http://ieeeboston.org/event/modern-applications-of-risc-v-cpu-design-course/?instance_id=2955

Software Development for Medical Device Manufacturers

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SESSION 4 – Software Tool Validation and Risk Management

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

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

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

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

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

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

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

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

Call for Course Speakers/Organizers

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

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

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

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

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

LEARNING CENTER

Presented by: **Microwave Journal**

NOW 9/14

RF Components in Emerging SATCOM Applications

Sponsored by: **knowles** PRECISION DEVICES

NOW 9/15

Latest PCB Material Solutions for 5G Radio Access Networks

Sponsored by: **ROGERS CORPORATION**

NOW 9/16

New mmWave Technology Offers High Performance with Reduced Size and Weight for Space Based Applications

Sponsored by: **RfMW** It's who we are It's what we do / **CUBIC NUVOTRONICS**

NOW 9/16

An Introduction to OpenRF: A New Approach to 5G Multi-Mode RFFE Device Challenges

Sponsored by: **OPENRF**

ONLINE PANEL SERIES

9/8 — **UWB Location and Security Applications Coming to Market**

9/22 — **DoD Market Trends for New Technologies**

Register to attend at mwjournal.com/webinars

FEATURED e-Books

mwjournal.com/ebooks

Microwave Journal eBook
Developments in mmWave Phased Array Architecture
August 2021
SPONSORED BY **knowles** / **RfMW**

Microwave Journal eBook
mmWave Technologies and Product Innovations
August 2021
SPONSORED BY **Richardson Electronics** / **qorvo**

25th Annual
2021 IEEE High Performance Extreme Computing Virtual Conference
21 - 23 September 2021
IEEE-HPEC.ORG

IEEE BOSTON SECTION

BOSTON

High Performance Extreme Computing

DELL Technologies | Hewlett Packard Enterprise | Lenovo | NVIDIA | MITRE | MIT Lincoln Laboratory | siam
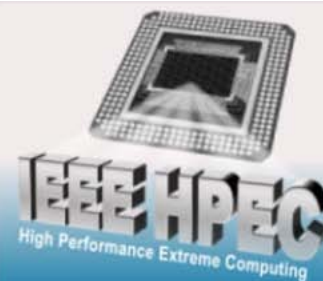
Early-bird registration ends on September 1, 2021

REGISTER NOW!

	EARLY Registration (ends September 1, 2021)	Standard Registration (ends September 23, 2021)
IEEE/SIAM Member	$180	$220
Non-Member	$220	$260
IEEE/SIAM Student	$140	$180
Non-Member Student	$180	$220
Basic Participation*	$0	$0

Special Events!

⇒ **MIT/Amazon/IEEE Graph Challenge**

⇒ **GraphBLAS**

⇒ **Remote Sensing for Humanitarian Assistance & Disaster Relief**

⇒ **HPSEC: High Performance Secure Extreme Computing**

⇒ **BRAIDS**

⇒ **Bridging Quantum and High Performance Computing**

⇒ **Scaling HPC Education**

⇒ **AI Challenges**

info@IEEE-HPEC.org

Distinguished Speakers!

Neil Thompson
Michael Stonebraker
Sadasivan Shankar
John Reynders
David Clark
Paul Radovitzsky
David Beskow
Serge Leef
Miriam Leeser
Bhavesh Patel
Sandy Pentland
Martin Herbordt