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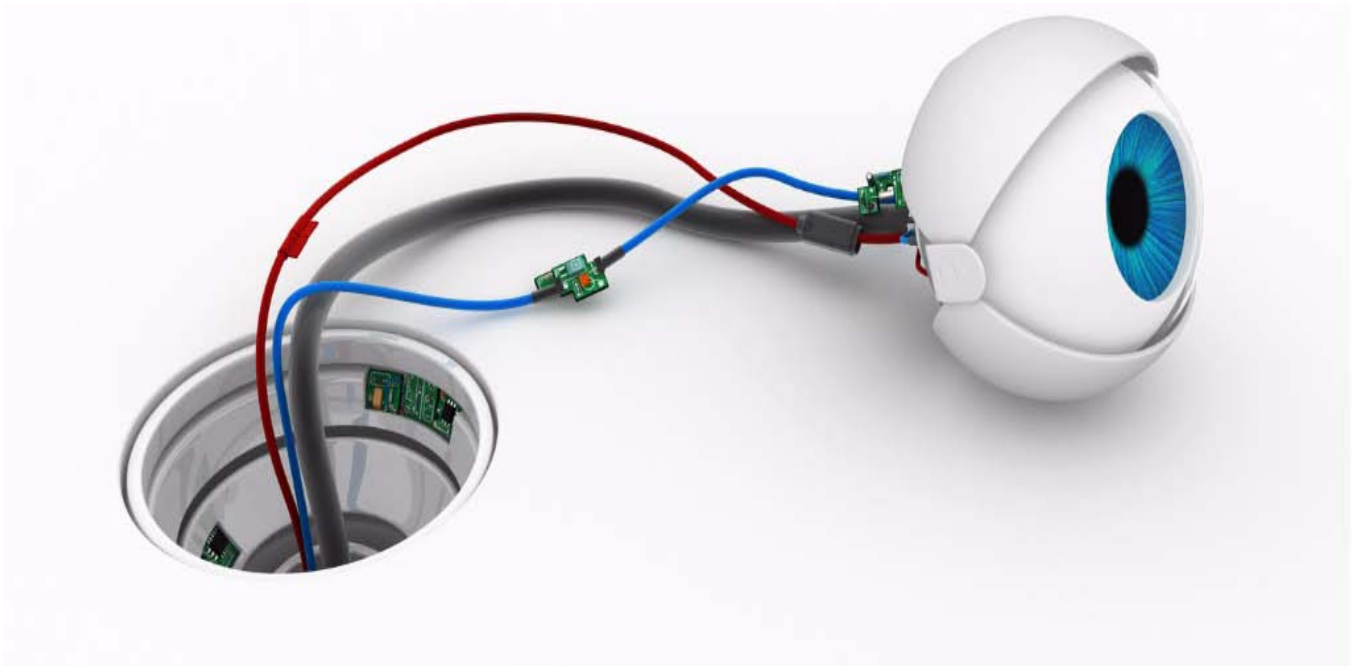

IEEE
Advancing Technology for Humanity

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Is Technology Making us Cognitively Blind?

by Karen Panetta, Reflector Editor

When was the last time you were in a mall? I used to visit malls so often before the Pandemic that it became my form of exercise. I would zigzag through crowds avoiding coughing patrons and aggressive cart vendors. Now, I rarely visit malls and when I do, I find that it was a waste of my time. The items I am seeking aren't there and everything needs to be ordered and shipped.

Thus, I am now an online shopper and have become quite the shopping ninja. I contend that no one can hit the "buy now" button faster than me. When in doubt, I buy different sizes of the same item and return one because of free shipping options. Unfortunately, when I see items tagged as the "last one", I know it's purely a pressure tactic, but I can't refuse. It's like a moth attracted to the flame and I just can't stay away from the light. The thought of the regrets I would have if I missed out on that elusive dust gathering item that everyone wants is just too much to bare. The shock and awe arrives when I open my credit card bill. This has caused me to do a deep reflection on how technology has made some things too easy and brought other new unexpected issues that negatively affect our lives.

My driveway has begun to show cracks and crumbling due to the revolving door of delivery trucks stopping and turning around in my driveway, not just for the delivery of my purchases, but also for my neighbors'. The motion detection cameras around my home go off constantly showing the arrival/departure of delivery people as they seek the most obscure places to drop off my packages. My phone sends incessant alerts interrupting my attention during meetings, meals and while I am driving. If a real burglar was around the house, I have become so cognitively blind to these alerts, that I most likely would ignore it, thus defeating the purpose of all these security aids.

I convince myself that since I am a dedicated recycling advocate, that the boxes and packaging filling my garage each week are being responsibly recycled and repurposed. I have noticed some online providers are now offering a small discount if I wait until all items are available to ship together in one box instead of incurring multiple deliveries. This means less trucks stopping at my home, thus saving energy, and incurring less packaging. However, I have become so addicted to the "want it now, get it now" syndrome that waiting an extra day is not an option.

Sometimes things I ordered don't show up and I get concerned that I have been scammed. I waste a considerable amount of time on a company's website looking for ways to connect with a "human" to follow up on my order. Unfortunately, everything is now "chatbot" driven, meaning I must type in my question and wait for the automated response. If it has a voice activated option, if fails because it can't understand my true Bostonian English.

It's clear that the chatbot is a program and not a human, despite the company's efforts to make me think otherwise. Giving a program a human name only frustrates me more and insults my intelligence. These chatbots work well when the issue is a common one, but most of the time, the chatbot is useless and gives up on me.

I swear that vendors have an if-then-else statement in their chatbot code that says, "if Karen Panetta is using this chatbot, then give a random nonsensical answer and exit the program."

My email inbox has exploded due to the subsequent marketing lists I am now on due to using those initial discount codes requiring I supply my email address.

Now, my colleagues trying to email me, text me instead to inform me my inbox is full. I missed the email announcing the sign up for a time slot for my kid's parent-teacher meeting and look like a delinquent parent.

I address these issues by investing time and money installing new filters and email organizers to manage the tsunami of junk mail offering more stuff. My favorite marketing ploys are the ones that have timers on them that display the launch of a new product and entice us to get into the waiting queue for these exciting new products. They make it seem like quantities are limited and only a few of the lucky ones will be honored to secure the item.

The good news is that with all these new challenges come new economic and entrepreneurial opportunities to fix the unexpected by-products of moving our interactions online and living virtually. Young aspiring engineers are becoming more dedicated to social impact and jumping into start-ups right out of school. They are taking risks and investing in solving challenges no one saw coming.

I have the pleasure of working with several brilliant IEEE Young Professionals who are helping me to commercialize my own intellectual property. They are fearless and I am truly inspired by them, but I need them to move faster because I am so exhausted with online shopping and virtual meetings that I now don't have any time or energy to cook meals.

So, I make an old-fashioned voice call to a local pizza shop only to find that I must use an app to place my order. It requires another download and me entrusting the app with my credit card information. It promises the app is "secure" but as engineers we know that new cyber-attacks are coming out every day, so it comes down to how much do I want that pizza? I really want the pizza, so I take the risk and the cycle continues!

If you want to help mentor a young professional start-up, consider volunteering to our IEEE Young Professionals and IEEE Women in Engineering Affinity groups. Click here to send an email to IEEE Young Professionals and IEEE Women in Engineering: https://ieeeboston.org/ieee-boston-society-chapters-and-affinity-groups/

Call for STEM Proposals

The IEEE Boston Section is calling for proposals for funding a STEM activity. We are looking for a group willing to or already working on Pre-U STEM educational activities.

The requirements are as follows:
- The group must be running the project or event in the Boston Section geo area.
- The target age group is K - 12.

Please submit a one-page proposal with details of your program including overview/summary, logistics, collaborators, estimated number of participants, location, and date of the event as well as a detailed budget.

Proposals are due by December 6, 2021

Proposals will be submitted to ieeebostonsection@gmail.com.

IEEE Boston Section Online Courses:

(Students have 180 day access to all online, self-paced courses)

Electronic Reliability Tutorial Series

Full course description and registration at ,
http://ieeeboston.org/electronic-reliability/

High Performance Project Management

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

Introduction to Embedded Linux Part I

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

Embedded Linux Optimization - Tools and Techniques

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

Embedded Linux Board Support Packages and Device Drivers

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

Software Development for Medical Device Manufacturers

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

Fundamental Mathematics Concepts Relating to Electromagnetics

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

Reliability Engineering for the Business World

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

Design Thinking for Today's Technical Work

http://ieeeboston.org/design-thinking-technical-work-line-course/

Fundamentals of Real-Time Operating Systems

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

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 CO2 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.

Entrepreneurs' Network and, Technology and Engineering Management Society – 7:00PM, Tuesday December 7

Creative Startup Funding Resources

There are more ways to raise money than just from friends and family, Angels, or Venture Capitalists. We will show you how to apply for and win non-dilutive government and foundation grants including SBIR's; enter and win business plan competitions; leverage accelerators and incubators for growth opportunities, mentorship, and capital; and how to use strategic partners to provide funding, more grant opportunities, develop products and get to market faster.

Our panelists have used all these methods to fund their companies, multiple times. So join us and learn how you too can creatively fund your startup!

Agenda:

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

Speakers:

Brian Hess - Chief Executive Officer, RevBio
Brian has fifteen years of medical device development experience and was the recipient of the 2010 Innovator of the Year Award at Stryker Corporation where he was the co-inventor of the Tetranite bone adhesive technology. While at Stryker, Brian also developed and launched HydroSet™, a synthetic bone substitute, which is a key predicate to RevBio's Medical's Tetranite technology. Most recently, Brian was the Chief Technology Officer at InVivo Therapeutics. Brian is co-inventor of over ten patents and received his BS in Mechanical Engineering from the UW-Madison and his MBA from the MIT Sloan School of Management.

Greg Mannix - CEO and Co-Founder, Novaurum Bioscience VP International Business Development, and General Manager Europe, Life Science Nation
Greg Mannix is a senior business development, sales and marketing professional. After graduating from the University of California, he moved to Europe where he began a career in the life sciences and obtained a Graduate Diploma in International Studies from the Diplomatic School of Spain and an MBA from IE Business School in Madrid. He has extensive experience in sales and marketing management in the medical devices field. He has worked extensively in Europe, North America and Latin America and he speaks English, Spanish and French. Greg has been working for the past 6 years in the Boston/Cambridge life science hub, providing early-stage companies with the tools and strategies to succesfully fundraise and to facilitate cross-boarder investments, licensing and M&A transactions and works actively as a mentor with several international accelerator programs. Greg has recently co-founded Novaurum Bioscience, a spinout from Northeastern University.

Natalie S. Rudolph - Ph.D., Rudolph Biomedical Consulting
Rudolph Biomedical Consulting works with early-stage technology companies to identify non-dilutive funding opportunities, design R&D projects, and write grant applications to fund them. Project areas include biotechnology, medical devices and telehealth. My focus is Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants and contracts from NIH, NSF and DOD. However, my work spans a wide range of opportunities from agencies such as BARDA, DARPA, NIH, NSF, DoD, AHRQ and PCORI. Although my clients include academic investigators, I especially enjoy working with the energy and enthusiasm of entrepreneurs!

Moderator & Organizers

Michael S. Chester - President, International Manufac-

turing Consultants, Chair Emeritus Boston Entrepreneurs' Network (ENET)
Mike has co-founded high tech, clean tech, and medical device startups in both the US and China and is now an advisor to start-ups. Before becoming an entrepreneur, Mike spent 16 years with IBM designing robots and automation, marketing and selling IBM products to manufacturing companies, setting up global operations and supply chains, and founding a consulting organization for IBM manufacturing clients. He lived in China from 1986-1987 while consulting to companies owned by the Machine Building Ministry and teaching graduate courses at Hunan University.

Mike earned his BS in Electrical Engineering and MS in Computer Engineering from Syracuse University and his MBA from Union College. He is Chair Emeritus of ENET, has served on the board of APICS Boston, was a member of the planning committee of the MIT Enterprise Forum, and is a judge and mentor to companies competing in the Mass Challenge, Clean Tech Open, and other business plan competitions. Mike and his sons have competed on the TV show Robot Wars with their robotic rabbit, "Bunny Attack".

Register NOW!
Free for ENET members. Join now >>
https://bostonenet.org/membership/
$10 for general public.

*To register as a member, you need to enable cookies (which most browsers do by default). For instructions on enabling cookies in different browsers, click here. If you using Safari as your browser, you also need to enable cross-site tracking by disabling the Prevent Cross-Site Tracking option.

Registration for this event will close on Tuesday, December 7 at 3 PM. All times are USA Eastern Standard time, webinars will not be recorded.

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

Boston/Providence/New Hampshire Reliability Society Chapter – 11:00AM, Wednesday, December 8

Process and Value Stream Mapping Basics

To view complete details for this event, click here https://us06web.zoom.us/webinar/register/WN_qgX8bkO-S2eySLN03dIPwA to view the announcement and to register
Sponsor: IEEE Boston/Providence/New Hampshire Reliability Chapter. Please visit our website at www.ieee.org/bostonrel
Host: Quality Support Group
All times are US/Eastern
Location: This Webinar is to be delivered virtually.

FREE Webinar
Dr. W. Edwards Deming defined a system as "a series of functions or activities (sub-processes, stages – hereafter components) that work together for the aim of the organization." He added that the flow chart (or process map) is helpful toward understanding a system. Process mapping is a technique that provides a structured analysis of a process flow. It can be used to distinguish how work is actually being done from how it should be done. It's very important to map the actual situation ("As Is" or "Current State") to identify opportunities for improvement. Further study leads to mapping how the process "Should Be" (or Future State) once improvements are achieved.

Moving beyond basic process mapping, Value Stream Process Mapping (VSPM) can be viewed as a means to expose waste that's hiding in the organization's systems and processes. It's used to quantify the flow of throughputs as well as waste, rework, queue time and other drains on resources. It is a technique that is easily and effectively applied in any type of process – manufacturing, laboratory, health care, retail, office, school… Join Jim Leonard to examine clear guidelines to closely assess your current processes, and effective tools for exposing opportunities for improvement that eliminate frustration, errors, delays and excessive costs. The webinar will cover the following topics:

- Product Quality versus Process Quality
- Shewhart's Concept of a Process
- Process Mapping Terms and Symbols
- Examples of Various Process Maps – Manufacturing and Non-Manufacturing
- Procedure for Generating the Initial Process Map
- Value Stream Process Mapping
  - The concept of "white space"
  - Defining meaningful and actionable data
  - Calculating the Value Effectiveness Ratio
- Moving from the Current State to the Future State
- Let's Draft a Value-Stream Process Map

At registration, you must provide a valid e-mail address to receive the Webinar Session link approximately 15 hours before the event. The link will only be sent to the e-mail address entered with your registration. Please double-check for spelling errors. If you haven't received the e-mail as scheduled, please check your spam folder and alternate e-mail accounts before contacting the host.

Contact
- Email event contact
- Michael W. Bannan, Chair
- IEEE Boston/Providence/New Hampshire Reliability Chapter

Registration: There is no cost to register or attend, but registration is required. Register

Speaker: Jim Leonard of Quality Support Group

Biography
James F. Leonard is a semi-retired consultant and educator who specializes in teaching the principles of the late Dr. W. Edwards Deming as a new system of management. His clients come from a wide variety of industries, including electronics, health care, chemicals, biotech, injection molding, medical devices, and consumer products, and he has also worked with service organizations, schools, and government agencies.
Jim has worked with manufacturing and service organizations throughout North America, Europe, and in China. He serves as a senior consultant for Quality Support Group in Westford, MA. For 29 years Jim presented his seminars for the Division of Corporate and

Professional Education at the Worcester Polytechnic Institute in Worcester, MA, where he also served as an Adjunct Professor of graduate Operations and Industrial Engineering.

Jim is an alumnus of the U.S. Naval Academy, where he majored in Mechanical Engineering and Analytical Management, as well as the George Washington University and Clark University. He resides in Ave Maria, FL, with his wife Kate. They are the proud parents of six children and the grandparents of ten grandchildren.

Agenda
11:00 AM Technical Presentation
11:45 AM Questions and Answers
12:00 PM Adjournment

The meeting is open to all. You do not need to belong to the IEEE to attend this event; however, we welcome your consideration of IEEE membership as a career enhancing technical affiliation.There is no cost to register or attend, but registration is required. Register - https://us06web.zoom.us/webinar/register/WN_qgX8bkOS2eySLN03dIPwA

Photonics Society – 7:00PM, Thursday, December 9

Evolution of Machine Learning for Photonic Research

Speaker: Toshiaki Koike-Akino (Mitsubishi Electric Research Laboratories)

In the past years, machine learning has been widely used for various research themes. In this talk, we first overview the trends of machine learning techniques applied to optics and photonic research. Focusing on two mainstreams, optical fiber communications and photonic integrated circuits, we then introduce some or our R&D works at MERL. Specifically, we present learning-based nonlinearity compensation techniques for coherent optical communications, and also inverse design framework for nano-photonic devices. Beyond past works, we finally foresee potential future trends including quantum machine learning for photonic research.

Biography: Toshiaki Koike-Akino received the B.S. degree in electrical and electronics engineering, M.S. and Ph.D. degrees in communications and computer engineering from Kyoto University, Kyoto, Japan, in 2002, 2003, and 2005, respectively. During 2006–2010 he was a Postdoctoral Researcher at Harvard University, and joined Mitsubishi Electric Research Laboratories (MERL), Cambridge, MA, USA, in 2010. His research interests include signal processing for data communications, computing and sensing. He received 14 prestigious awards including the YRP Encouragement Award 2005, the 21st TELECOM System Technology Award, the 2008 Ericsson Young Scientist Award, the IEEE GLOBECOM 2008 Best Paper Award in Wireless Communications Symposium, the 24th TELECOM System Technology Encouragement Award, and the IEEE GLOBECOM 2009 Best Paper Award in Wireless Communications Symposium. He has more than 260 publications in peer-review journals/conference proceedings, more than 250 patent applications, and more than 3,700 citations worldwide. He is an author of 4 book chapters. He serves TPC members for major conferences including OFC 2022. He is a Fellow of Optica (formerly OSA).

Registration Information: It will be posted at our web site two days prior to the meeting at the latest.
http://www.bostonphotonics.org/seminar.aspx?seminar=348

Geoscience and Remote Sensing Society - 6:00PM, Wednesday, December 8

Simulating the Performance of Ocean-Observing Imaging Payloads for Nanosatellites

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 tradespace, is provided, along with preliminarily results of the simulated performance.

Bio: 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

Engineering in Medicine and Biology Society – 12:00PM, Thursday, December 9

Multifunctional Integrated Nanoelectronics for the Brain

Speaker: Dr. Hui Fang

Reverse-engineering the brain demands complex approaches, which require dovetailed cross-disciplinary efforts and convergence research. We believe nanoelectronics can be tailored to uniquely complement many other fields and practices of studying the brain through adding multifunctionality towards achieving convergence while keeping their electronic advantage to integrate and scale across spatial and temporal domains. We refer to this multifunctional integrated nanoelectronics for the brain as neuroelectronics+.

In this talk, I will introduce our neuroelectronics+ concept. I will also discuss several of my group's recent examples along this vision embodied in the forms of microscopical, therapeutic, and connectomical neuroelectronics+, all enabled by new concepts in materials science, electrical engineering, and advanced manufacturing. In addition to fundamental merit in engineering innovations, we envision the development and translation of neuroelectronics+, and more broadly, bioelectronics+ will transform both biology and medicine.

Speaker:
Hui Fang received his B.S. degree in 2009 from Tsinghua University and his Ph.D. degree in 2014 from the University of California, Berkeley, both in Materials Science and Engineering. He was then a postdoctoral fellow at the University of Illinois, Urbana-Champaign from 2014 to 2016. After starting his independent career at Northeastern University in 2016, he joined Dartmouth College in 2021 as an Associate Professor in the Thayer School of Engineering. Fang's research interests encompass the fields of neuroelectronics, electronic materials, and electroactive organisms. His research has been recognized by multiple awards, including an NSF CAREER Award (2019), an NIH R01 Award (2020), and an NIH U01 Award (2021), and has been cited over 7600 times.

Registration: Register in advance for this meeting: https://events.vtools.ieee.org/m/290690
After registering, you will receive a confirmation email containing information about joining the meeting.

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

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

Entrepreneurs' Network – 7:00PM, Tuesday, December 21

Raising Money for your Startup & Storytelling as a Fundraising Strategy

Are you raising money or preparing to? Do you have a fundraising strategy that communicates your story over the key inflection points investors are looking for?

Competition to raise capital is fierce. Our esteemed panel of investors, storytelling strategist and entrepreneurs successful in raising funds will share success perspectives and tips to help you craft your fund raising story.

Agenda:
7:00 - 7:10 PM - ENET Chairperson's announcements
7:10 - 7:25 PM – eMinute Pitch - Up to 3 Startup companies' presentations
7:25 - 8:15 PM - expert speakers on the night's topic
8:15 - 8:30 PM – Moderator and Audience Q & A with the speakers
8:30 – 9:00 PM - Networking on Zoom Network
(all times are USA Eastern Daylight time)

Speakers:

Teresa Whalen, CEO, Cytoagents. www.cytoagents.com
Teresa Whalen has had a 20+ year career in Life Sciences. As a biotech innovator, healthcare technology leader, life sciences investor, hospital board trustee and clinical pharmacist; she has a successful track record of bringing life-changing healthcare products to market.

As the CEO of CytoAgents, she leads a team who are at the forefront of groundbreaking treatment for Cytokine Releasing Syndrome (CRS), an overreaction of the immune system causing systemic inflammation.

Chuck Goldstone, CEO, Chuck Goldstone's Strategies and Stories. https://chuckgoldstone.com/
Author, communications strategist, entrepreneur, creative catalyst, keynote speaker, and mentor Chuck Goldstone has helped individuals and organizations across the planet learn how to find their voice and tell their story, to be engaging, clear, and memorable.

He was founder and CEO of !deaworks | IdeaCorporation of America, where he worked with domestic and global companies such as Pepsi-Cola, Keurig, IBM, Fidelity, the United States Air Force, and hundreds of others in nearly every sector. He founded the New Venture Initiative and Chuck Goldstone | Strategies and Stories, coaching emerging companies across the globally in the development of their strategies and stories, moving them from the traditional and too-often ineffective pitch, to the art and science of narratives and materials that move audiences to alignment and action. Through his workshops, mentorships, speaking engagements, Chuck's model and practices are renowned worldwide for changing the course of organizations. For more than a decade, Chuck was also a commentator on public radio's Marketplace, heard on over 400 stations nationally. He is an author of two books and an upcoming one on the art and science and the business story. He founded and hosts a Global Entrepreneurial Roundtable.

Debbie Kantor, APRN, MSN, CEO Hero Medical. https://heromedtech.com/home
Debbie Kantor APRN, MSN is a Gerontological Nurse Practitioner trained at the University of Pennsylvania School of Nursing, where she later joined the faculty. While on the Clinical Faculty at Penn from 1999-2005, she taught head-to-toe physical exam to nursing students before moving to Florida where she raised her two children. After a few years of practicing as an NP in home health and clinic settings, she realized unmet patient needs related to wound care and assessment, and patented the first cap-shaped dressing for the head or amputated limb.

Debbie founded Hero Medical Technologies, a MedTech startup focused on efficient solutions to bandage,

triage, and monitor patients throughout the patient journey. She was awarded a Johnson & Johnson JLABs Quickfire Innovation Challenge for the novel dressing that was later pre-clinically tested at the Mayo Clinic. Debbie continues to build a strong team to support her vision of creating a platform technology that integrates wound care, vital sign sensors, and Artificial Intelligence that will improve risk assessment and patient outcomes.

David Powsner, Intellectual Property attorney, Davis Malm. BHA Angel Investor.
Dave is an Intellectual property attorney and Boston Harbor Angel Investor. He is an active angel investor and advisor to high-tech companies on a range of complex matters. His physics degree from MIT and experience in computer programming, combined with his legal experience, enables him to understand, analyze and provide practical guidance on patent, copyright, trade secret, trademark, licensing and litigation matters.
Dave represents companies with products in a variety of tech markets, from medical devices to computer software to networking to consumer electronics.

Moderator and Co-Organizer:
Kristin King, MBA. Vice President, Corporate Development & Strategy, Defibtech, LLC
Kristin is an accomplished MedTech executive, serial

intrapreneur, investor and strategic advisor to startups developing biotech solutions. With over 20 years spanning technical, marketing, and proud member of Boston Harbor Angels, she offers multi-discipline expertise transforming technologies from early concept to successful global divisions at leading Medical Device companies and startups.

Dave Hall, Founder & CEO, DLH Technology, Advisors. Startup Strategy & Venture Capital Consulting www.DLHsales.com
Dave is Founder and CEO of DLH Technology. He is a startup & strategy Executive, Innovation Consultant, Advisor, Connector, Evangelist and Speaker for growth companies looking to implement, optimize, and fund their Go-to-Market plan.

DLH Technology Advisors offers consulting services including Startup Strategy, Product Development, Startup Frameworks, Business Development, Startup Marketing, Go-to-Market Strategy, Executive Coaching and Startup Funding Channels. DLH has resources for CRM development services including Salesforce implementation, AppExchange App Development, QuickStarts, Lead Architect and Admin Services for the entire Salesforce product line.

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Introduction to Quantum Software Development

Web-based Course with live Instructor!

Times & Dates: 6 - 8PM ET, February 8, 9, 10, 15, 16, 17, 22, 23, 24

Speakers: Joe Clapis, Richard Preston, MITRE Corporation

Course Format: Live lectures interspersed with lab exercises in Visual Studio

MITRE | SOLVING PROBLEMS FOR A SAFER WORLD®

This course is organized by the MITRE Corporation and being offered as part of the IEEE Boston Section's professional development program.

Summary:
In recent years, there has been an enormous surge of interest in quantum computing. Government, academic, and commercial organizations have spent billions of dollars attempting to create reliable, general-purpose quantum computers. These systems leverage the unusual properties of quantum mechanics to perform computations that could never be performed on conventional computers in our lifetime. Such calculations have a wide range of applications, including:

- Breaking certain cryptographic algorithms
- Engineering new materials
- Simulating how systems behave in extreme environments
- Finding new medicines that target specific diseases
- Building secure transmission channels that cannot be eavesdropped

How do quantum computers accomplish these bold claims? How could we use this technology to tackle our most difficult challenges? And how do programmers like you access it? In this course, we will explore the answers to these questions and help you unlock the ability to write quantum software and simulate quantum algorithms. Students should bring some basic programming experience and an open mind as we delve into a new computing paradigm.

Format: Live virtual lectures with self-paced exercises.

Target Audience: Practicing software engineers.

Objective: Develop the practicable skills needed to implement and study quantum algorithms in software.

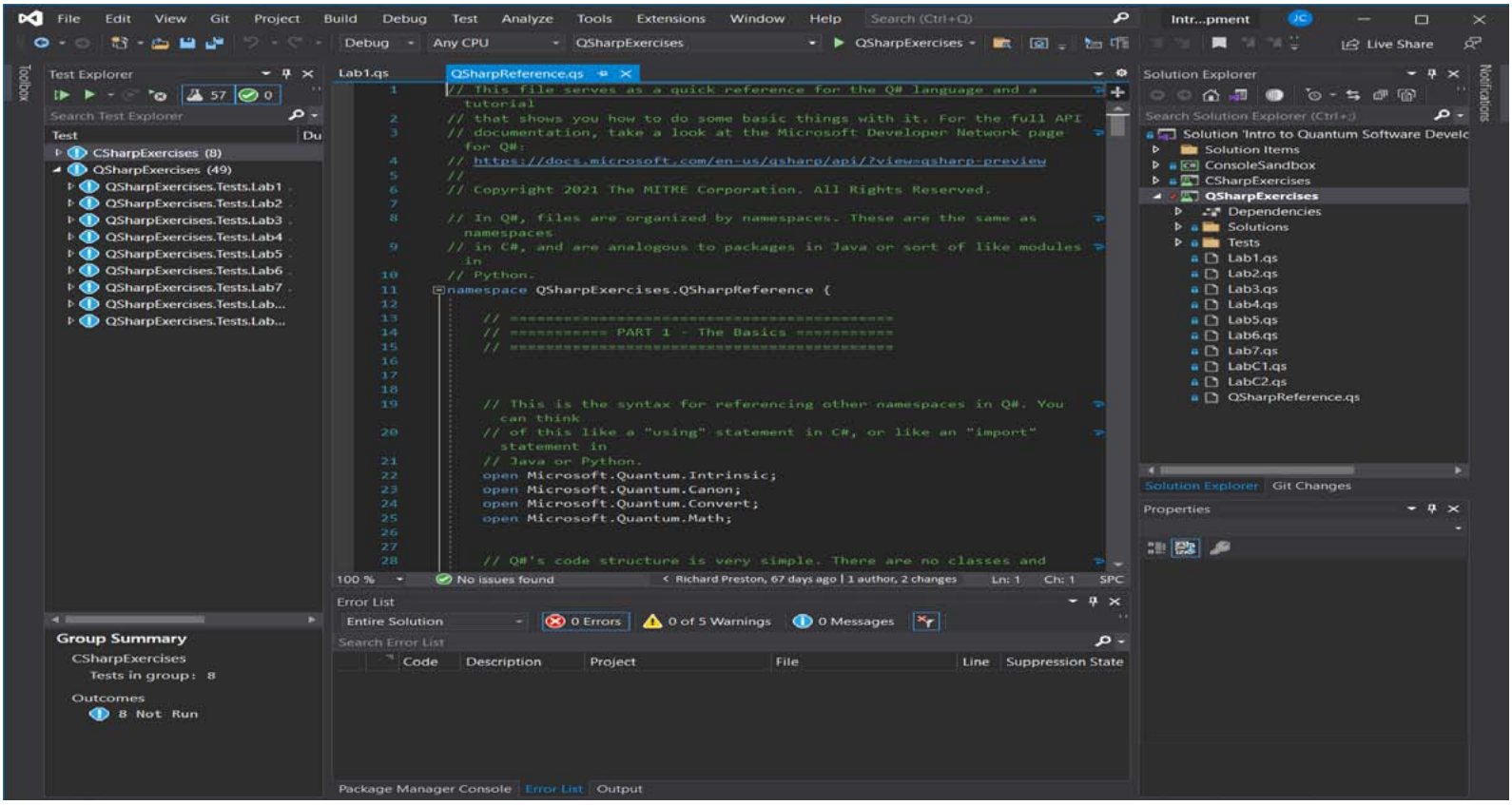
Prerequisites:
Students are assumed to have exposure to the following concepts:

- Complex numbers
- Vectors & Matrices
- Bra-ket and tensor notation
- Digital information
- Endianness
- Digital logic
- Low- and high-level programming
- Visual Studio

Learning materials covering the course prerequisites will be provided in advance. This way, students can fill in any gaps in their knowledge and everyone starts on the same page on day 1.

Outline:
The course consists of live lectures interspersed with lab exercises in Visual Studio. All the materials are available in the form of an online course guide, so students can learn at their own pace both during and outside of class time. To mitigate technical difficulties, each student is provided remote access to a virtual machine with a preconfigured environment. The following topics are covered:

- Qubits and quantum gates
- Multi-qubit systems
- Quantum circuits
- Quantum protocols
- Quantum algorithms
- Q# programming



The Visual Studio exercises are Q# operations that must be implemented correctly for a unit test to pass. This approach allows students to get immediate feedback on how well they understand a concept. We use the Discord platform as a course forum, where students can ask questions at any time and collaborate on solving the coding challenges.

Instructor Bios:

Joe Clapis is a Lead Software Systems Engineer at The MITRE Corporation. He has over 10 years of experience in a variety of software domains, from machine vision to virtualization, and now currently works on quantum software systems. His latest research involves bridging the gap between quantum algorithm theories and their practical implementations.

Richard Preston is a Network Analytics Group Leader in the Infrastructure and Networking Innovation Center at MITRE. He also serves as Co-Chair of MITRE's STEM Council, a group that supports STEM education initiatives across the company. He has been collaborating with Joe on quantum software research since 2019 and seeks to raise awareness and proficiency around this new technology.

Decision (Run/Cancel) Date for this Course is Tuesday, February 3, 2022

IEEE Members	**$250**
Non-members	**$325**

https://ieeeboston.org/event/ieeequantumsoftware

VHDL Circuit Design, Simulation and FPGA Programming Using VIVADO

Web-based Course with live Instructor!

Times & Dates: 11AM - 12 noon ET, February 15, 17, 22, 24, March 1, 3, 8, 10, 15, 17
Speaker: Orhan Gazi, Cankaya University, Ankara-Turkey
Course Format: Live Webinar, 10, one hour, sessions

Introduction: In this course VHDL circuit design language will be taught. VIVADO Platform will be used for VHDL coding, simulation and FPGA programming. The attendee should have basic knowledge of digital circuit design. VHDL language is an hardware design language. Its popularity is increasing in years. It is used to program FPGA devices. It is not exaggerating to say that most of the future electronic systems will include FPGA devices in their structures since FPGA devices are flexible, reconfigurable platforms for hardware designs. The attendee taking this course will learn VHDL language and he or she will be able to make digital circuit design using VHDL language. Besides, the attendee will learn how to program FPGA devices for circuits designed using VHDL.

Prerequisite: The one who is interested in taking this course should have basic knowledge of digital logic design. He or She should be familiar with the terms binary encoders, decoders, multiplexers, counters, registers, etc.

Topics:
Entity, Architecture and VHDL Operators
Project Creation Using VIVADO, Schematic, Synthesis
Internal Structure of FPGAs, LUTs, Slices
Combinational Logic Circuit Design and Concurrent Coding in VHDL
Testbench Writing and Simulation of VHDL Codes Using VIVADO
Constraint Files and FPGA Programming with VIVADO
User Defined Data Types in VHDL
Sequential Circuit Implementation in VHDL
Frequency Division in VHDL
Testing Sequential Logic Circuits on VIVADO
Packages, Components, Functions, and Procedures in VHDL
Fixed and Floating Point numbers in VHDL
Target Audience: Electronic and Communication Engineers, electronic engineers, computer engineers, engineers working in communication industry

Benefits of Attending Course:
1) The participant will learn how to design digital circuits using VHDL.
2) The participant will learn how to create projects and make simulations in VIVADO.
3) The participant will learn how to program an FPGA device.
4) The participant will have an idea about the architecture of FPGA device.

Speaker Bio: Prof. Orhan Gazi is the author of the book "A Tutorial Introduction to VHDL Programming" https://www.springer.com/gp/book/9789811323089

Prof. Orhan Gazi is the author of 10 books written in electrical engineering subjects. He is also one of the authors of the book "State Machines using VHDL: FPGA Implementation of Serial Communication and Display Protocols" which can be reached from https://www.springer.com/gp/book/9783030616977

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 Tuesday, February 8, 2022

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

https://ieeeboston.org/event/vhdl-circuit-design-simulation-and-fpga-programming-using-vivado/?instance_id=3160

State Machines and Timed State Machines in VHDL: FPGA Implementation of RS232, SPI and I2C Serial Communication Protocols

Web-based Course with live Instructor!

Times & Dates: 11AM - 12 noon ET, March 22, 24, 29, 31, April 5, 7, 12, 14, 19, 21
Speaker: Orhan Gazi, Cankaya University, Ankara-Turkey
Course Format: Live Webinar, 10, one hour, sessions

Introduction: State machines are used to characterize the behavior of digital electronic circuits. State machines are widely used in industrial applications. For instance, they are used in factories for control applications. State machines are also used in communication technology. It is essential for an electronic engineer to have knowledge of state machines and their practical implementations. In this course, we first provide information about state machines, and then teach the implementation of state machines in VHDL language. We use VIVADO platform for development, simulation and FPGA programming purposes. For practical applications, we implement serial communication protocols such as RS232, SPI, I2C in VHDL. We consider the VHDL implementation of SPI protocol for AD7303 device, and also we implement I2C protocol for ADT7420 Digital Temperature Sensor.

Prerequisite: Basic knowledge of VHDL circuit design.

Topics:
State machines and Modeling of Mathematical and Physical Problems by State Machines

Mealy and Moore State Machines

VHDL Implementation of Finite State Machines, Example Implementations

Timed State Machines and Their VHDL Implementations, Example Implementations

RS232 Asynchronous Serial Communication and its VHDL Implementation

Simulation of State Machines Using VIVADO

Serial Peripheral Interface and Its VHDL Implementation

Sine Signal Generation and SPI Protocol Development in VHDL for Digital to Analog Converter (DAC) AD7303

Inter Integrated (I2C) Serial Communication Protocol and Its Implementation in VHDL

VHDL Implementation of I2C Communication Between FPGA and ADT7420 Digital Temperature Sensor

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

Benefits of Attending Course:
1) The participant will learn about state machines.
2) The participant will learn how to implement state machines in VHDL.
3) The participant will learn how to implement timed state machines in VHDL.

4) The participant will gain knowledge about serial communication protocols, RS232, SPI, and I2C.

5) The participant will learn how to use SPI, I2C protocols in VHDL for practical electronic devices AD7303 (DAC) and for ADT7420 Digital Temperature Sensor.

Speaker Bio: Prof. Orhan Gazi is one of the authors of the book “State Machines using VHDL: FPGA Implementation of Serial Communication and Display Protocols” which can be reached from https://www.springer.com/gp/book/9783030616977

He is also sole author of the book "A Tutorial Introduction to VHDL Programming"

https://www.springer.com/gp/book/9789811323089

Prof. Orhan Gazi is the author of 10 books written in electrical engineering subjects.

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, Thursday, March 17, 2022

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

https://ieeeboston.org/event/state-machines-and-timed-state-machines-in-vhdl-fpga-implementation-of-rs232-spi-and-i2c-serial-communication-protocols/?instance_id=3150

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.

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

Web-based Course with live Instructor!

Times & Dates: 9AM - 12:30PM ET, Saturday, March 19

Speaker: CL Kim

Course Format: Live Webinar, 3 hours of instruction!

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 attend, 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 Monday, March 14, 2022

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

https://ieeeboston.org/event/neural networks/?instance_id=3181

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

CALL FOR PAPERS

2022 IEEE International Symposium on Phased Array Systems and Technology

Revolutionary Developments in Phased Arrays

IEEE BOSTON SECTION

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

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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

BOSTON 2022

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This Month

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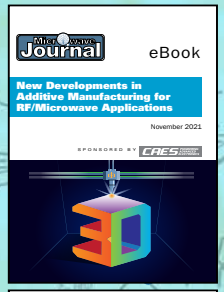

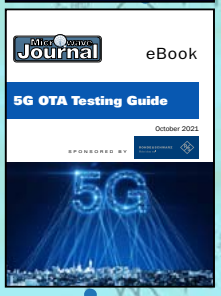

RF Industry Icons: Ferenc and Chris Marki - When You Stop Innovating, You Go Hungry

5G Network Deployment Challenges and Solutions - Part V, Smart Agriculture

Frequency Matters: Nov 5G/IoT Themed Issue

Learn About VNA Market and Release of Mini-Circuits' First VNA

Virtual Panel Sessions

Next Generation 4D Radar Sensors for In Cabin Sensing, ADAS and Autonomy

Dec 14 **11am ET**

eLearning Center

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