BOSTON

THE REFLECTOR

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IEEE
Advancing Technology for Humanity

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SAVE THE DATE! PLAN TO ATTEND!

PLENARY SPEAKERS:

Kay C. Goss, CEM, President, World Disaster Management, LLC *Internationally recognized expert, lecturer, author on Emergency Management and General Resiliency*

Dr. Melissa Flag, CEO, Flagg Consulting, LLC. Previously she served as the Deputy Assistant Secretary of Defense for Research in the Office of the Assistant Secretary of Defense, Research and Engineering (OASDR&E) within the Department of Defense (DoD)

The 16th annual IEEE Symposium on Technologies for Homeland Security (HST '17), will be held 25-26 April 2017 **must attend event**, in the Greater Boston, Massachusetts area. This symposium brings together innovators from leading academic, industry, business, Homeland Security Centers of Excellence, and government programs to provide a forum to discuss ideas, concepts, and experimental results.

Produced by IEEE with technical support **from DHS S&T, IEEE, IEEE Boston Section, and IEEE-USA** and organizational support from **MIT Lincoln Laboratory, Raytheon, Battelle, and MITRE**, this year's event will once again showcase selected technical paper and posters highlighting emerging technologies in the areas of

There are over 110 paper and posters to be presented at the symposium with focus on technologies with applications available for implementation within about five years. All areas will cover the following common topics:

- Strategy and threat characterization, CONOPs, risk analysis,
- Modeling, simulation, experimentation, and exercises & training, and
- Testbeds, standards, performance and evaluations.

In addition there will be plenary sessions as well as ample networking activities to interact and exchange ideas with speakers and other symposium attendees.

Contact Information

For more detailed information on sponsorship and Exhibit Opportunities, visit the website http://ieee-hst.org/ or email: information@ieee-hst.org.

The symposium technical program as well as the conference registration and hotel reservation pages are now online (www.ieee-hst.org)

Technical Sessions

Cyber Security Track:
#1: Cyber-Physical Systems
#2: Authentication
#3: Intrusion Detection
#4: Approaches in Cybersecurity Modeling
#5: Secure Systems
#6: Analytics
#7: Testbeds and Training Environments
#8: Privacy
#9: Classification and Scoring Algorithms in Cybersecurity

Attack/Disaster Track:
#1: Critical Infrastructure
#2: Cyber Risk Management and Intelligence Analysis
#3: Resilience
#4: Disaster Preparedness and Response
#5: Network Vulnerability
#6: Situational Awareness
#7: Machine Learning and UAV
#8: Terrorism and Disaster Preparedness

Plus 20 Poster Presentations during our Welcome/networking Reception

Border Security Track:
#1: Airborne Sensing
#2: Enhancing Data Exploitation 1
#3: Enhancing Data Exploitation 2
#4: Ground-based Hardware for Border and Customs Enforcement
#5: Counter-UAS and Small Aircraft Detection
#6: Underwater Imaging
#7: Human- and Cargo-Borne Concealed Threat
#8: Radiological and Nuclear Detection

Biometrics & Forensics Track
#1: Facial Recognition
#2: Finger and Palm Prints
#3: Video Analytics
#4: Ocular Biometrics and Other Modes

Potholes and Teenagers: The Rules of Engagement

by Karen Panetta, Reflector Editor

Do you remember when you were a teenager? Unfortunately, I do and quite vividly. As you probably already know, rule number one for teenagers is that teenagers know everything and are experts on everything, especially on topics, for which they have no prior experience. Teenager rule number two is that parents of teenagers know nothing, and the life experiences and wisdom parents possess is not relevant or applicable for teenagers.

I always get asked, “What advice do you wish someone had given you as a teenager, that you know now?” The answer is quite simple. It does not matter what anyone told me or advice they provided. I would have ignored it.

For instance, my father, who worked in the construction industry, once suggested I consider civil engineering as a possible discipline to study in college. I responded with, “No way, I don’t want to fill potholes for the rest of my life.”

Being a “binary” teenager, which means everything was either a “yes or no” and nothing in between, I had already made up my mind at his suggestion. The answer was “no”. There was no need to conduct any further investigation on the matter and the case was closed.

If I could go back in time, I’d give myself a smack up the side of the head for all the great advice I ignored, especially my father’s advice to go into business for myself.

Today, I would be quite content with a multi-million-dollar contract filling potholes on our roadways. Also, knowing there is never a shortage of potholes in our great state, I would have had tremendous job security.

Now, I realize that I know absolutely nothing, even though I am not yet the parent of a teenager, who will eventually tell me this. This realization has turned out to be a good thing. Why? Because now, I try not to make assumptions, jump to conclusions or rip people’s faces off for comments that show how truly clueless and uninformed they are about a topic. I look at every interaction, and attendance at a technical meeting as an opportunity to educate myself, and others and most importantly, to keep innovation brewing.

However, I do still hiss and growl at people who engage in unethical behaviors. Some things I just cannot and do not wish to change.

I have mentored and worked with cohorts of students for over twenty years. They come to me with their dreams and aspirations and I have learned quite a bit from them.

In academic engineering programs, all students are required to do a capstone design project. Some choose their own project concepts, others allow the Professors to choose for them. Over the years, I have seen creativity in overdrive from my students. One thing I have learned is that rule number one applies. They know everything, well almost everything.

The students may not have the exact path carved out on where they are going, but they are confident that they will get there. It is my job to help them do

exactly that, even if I don't quite comprehend the value proposition in what they are proposing.

In some cases, colleagues have said, "Why don't you tell the kid what a stupid idea that is?", I always remember the rules. Teenagers know everything and I know nothing. I never tell them they cannot do something or not to bother even trying. I always give them the tools to investigate the options and determine the feasibility for themselves. The proposed projects, where I struggle to understand what customer base on earth would buy the resulting products, are usually the projects that have made my students millionaires.

There is something about young engineers naivety that keeps their perspectives fresh and unbounded. It is truly refreshing.

An IEEE colleague once told me the story of a Venture Capitalist (VC) who saw a thirty second pitch for a start-up company back in the 1980's. The VC said the young entrepreneurs showed him a realistic animation of a person morphing (transforming) into an animal.

The VC's response was "so what?" and made the executive decision not to fund the company.

That company is now known as Pixar. Even today, that VC keeps kicking himself for his poor decision. I have personally exceeded a lifetime limit of poor decision making during my teenage years. So, knowing that teenagers and young adults know almost everything and will most likely ignore advice, which they view as authoritative directives, I always encourage them to make decisions for themselves based on their own investigations and discoveries. I always tell them to never give up on their dream goals and add that I am still working on achieving my own dream goals.

The fact that I still have my own aspirations surprises them. After all, rule number three of teenagers is that anyone over the age of 25 is considered old. At this point in my life, they think I should just climb in the box and close the lid. Young people expect to be successful right now, and not when they are "old".

Thus, all this has reinforced that unless I see imminent danger including ethical issues, my student mentoring approach is to listen, support, advise and most importantly, learn. One of the best ways I have found to arm students with information without stuffing it down their throats is to introduce them to the networks of individuals who know how to nurture good ideas and turn them into successful entrepreneurial ventures and products.

Here in the IEEE Boston Section, we have many groups that are doing just this. One is the Entrepreneurs' Network (www.boston-enet.org) and the other is the Consultants Network (www.boston-consult.org). These individuals have mastered the art form of knowing how to give young people advice, while making everyone value the advice and use it.

These affinity groups are not only providing resources to help young professionals meet their goals, but are the strongest support network for those of us who aren't quite ready to climb into the box and close the lid on our own innovation dream goals.

To answer the question, "What do I wish I had known back then?" I wish I had known that I didn't know everything and that to be successful, assuming we know nothing can remove all boundaries on innovation.

As always, the views expressed in our editorials are those of the author and not necessarily those of the IEEE Boston Section

Letters to the editor can be sent to, ieeebostonsection@gmail.com

The Institute of Electrical and Electronic Engineers, Inc.

Spring 2017 Professional Development and Education Program
www.ieeeboston.org

Phased-Array and Adaptive-Array Fundamentals and Their Recent Advances
Dates and Time: Ten Monday Evenings,
Feb. 27, March 6, 13, 20, 27, April 3, 10, 24, May 1, 15
(Snow/make-up dates May 22, June 5, 12
6:00PM - 9:00PM
MITRE Corporation, Bedford, MA

Introduction to Embedded Linux
Dates and Time: Mondays, March 20, 27, April 3, 10
6:00PM - 9:00PM

More Digital Signal Processing (DSP) for Wireless Communications
Dates and Time: Wednesdays, March 22, 29, and
April 5, 12, 26; 6:00PM - 9:00PM

Software Development for Medical Device Manufacturers: An intensive Two-day Workshop
Dates and Time: Wednesday, April 5 and Thursday,
April 6; 8:30AM - 4:30PM

Embedded Linux BSPs and Device Drivers
Dates and Time: Wednesdays, April 12, 19, 26
and May 3; 6:00PM - 9:00PM

QA and Testing in DevOps Automation
Date and Time: Thursday, April 20
8:00AM - 5:00PM

Advanced Embedded Linux Optimization
Dates and Time: Wednesdays, May 10, 17, 24 and 31
6:00PM - 9:00PM

Practical Antenna Design for Wireless Products
Dates and Time: Thursday, June 1 and Friday, June 2
9:00AM - 4:30PM

Making You A Leader Fast Track
Date and Time: Monday, May 22; 8:30AM - 5:00PM

Writing Agile User Story and Acceptance Test Requirements
Date and Time: Tuesday, May 23; 8:30AM - 5:00PM

Determining and Communicating Project Value Return on Investment (ROI)
Date and Time: Wednesday, May 24; 8:30AM - 5:00PM

Proactive User Acceptance Testing - Confident Competence
Date and Time: Thursday, May 25; 8:30AM - 5:00PM

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

- Verilog 101: Verilog Foundations
- Systems Verilog 101 (SV101) Design Construct
- Systems Verilog 102 (SV102) Verification Constructs
- High Performance Project Management

(Discounts available if register for all three Verilog Courses)

- Software Development for Medical Device Manufacturers
- Reliability Engineering for the Business World
- Fundamental Mathematical Concepts Relating to Electromagnetics
- Introduction to Embedded Linux

See our new online platform for these four new online courses!!!

All Courses are being held at the Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn unless otherwise noted. For more information on these courses and other local IEEE activity see our website at www.ieeeboston.org, email: ieeebostonsection@gmail.com, or call 781-245-5405

IEEE Boston Section Online Courses:

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

Verilog101:Verilog Foundations

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

System Verilog 101: Design Constructs

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

System Verilog 102: Verification Constructs

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

High Performance Project Management

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

Introduction to Embedded Linux Part I NEW Online course

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

Software Development for Medical Device Manufacturers NEW Online course

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

Fundamental Mathematics Concepts Relating to Electromagnetics NEW Online course

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

Reliability Engineering for the Business World NEW Online course

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

Entrepreneur's Network – 6:30PM, Tuesday, 4 April

Seed and Angel Financial in Tech Companies

Location: Constant Contact, 1601 Trapelo Rd., 3rd Floor Great Room, Waltham (Exit 28, I-95/Route 128)

Discover how Angel and Seed investors approach the problem of making a good investment. Go behind the scenes of the decision making to discover the process our panelist-investors use to choose and to invest in emerging and seed stage companies. Whether you are planning to launch a company or you are planning the next level, a Seed or Angel investor could be the funding source you are looking for. Maybe you're not even sure what angel investment is? This panel will focus on the nature of angel and seed investments in New England technology based companies, and on how to obtain that initial angel or seed-stage investment in your company.

The speakers will be investors in early stage life science companies and tech companies.
The panelists will also offer candid views and discussion on how to prepare a company for raising angel capital or seed stage investment, the raise itself, and how to work with angel groups or seed investors after getting the investment
Here are a few very common questions:

What are the best ways to find an angel who's investment interests align with my objectives?
How do Angels pick investments? What criteria is most important to them?
How do Angels decide how to value my company and how much to invest?
I'm getting ready to raise seed investment for my company. What should I know on behind the scenes when angel and seed investors contemplate whether or not to fund my venture?
How do I create an investor-friendly financial model for my business?

As with every ENET meeting you will also get the chance to network with the panelists and other meeting attendees, both before the start of the meeting and afterwards. There will also be a pre-meeting dinner for additional networking.

Speakers:

Vivek Soni - Managing Director
As Managing Director, Vivek oversees the operation of TiE Angels' activities and partnerships. He has extensive experience as a senior corporate executive, technologist, entrepreneur, board member, start-up mentor, advisor, and investor. Vivek is Managing Partner at Boston Cleantech which advises Cleantech companies. Vivek is a board member of A.T.E. Group companies. He was a Venture Advisor to London-based Nomura's expansion-stage, cleantech venture capital fund. Vivek served as President, Corporate Technology Strategy, and Services at the Aditya Birla Group in India. He has held technology roles at Polaroid Corporation and Shell USA.

Vivek has a Ph.D. in Polymer Science from the University of Massachusetts, Amherst and his B.Tech. from the Indian Institute of Technology, New Delhi. He is an active Charter Member and past Board Member of TiE-Boston.

Jerrold M. Shapiro, Ph.D.
Bioengineering -
President, Floelle, Inc.
Jerrold M. Shapiro Is a leader, fast-track developer and inventor of new medical devices. Shapiro works with gynecologists, nurse practitioners, physical therapists,

other healthcare providers and their patients since 2002 in the treatment of female urinary stress and mixed incontinence made me keenly aware of the way urinary incontinence reduces the quality of patients' lives. Despite the high efficacy of the pelvic floor exercise device we rented to them, patients with mild dementia could not remember the protocol, those with MS and paraplegia could not contract their pelvic floor muscles (PFM) and younger women busy with work and family responsibilities did not have the time to exercise. In April 2010 Cheri Grantham and Shapiro began developing a medical device which did not require exercise or the cooperation of the patient. Shapiro brings to this task over forty seven years of medical device experience, both in academia, private industry and consulting.

Shapiro has the leadership and technical skills, industry contacts and FDA experience to take this device all the way into the market so that it can greatly improve the quality of life of not just incontinent women, but of their caregivers and families, as well as saving third party payers such as Medicare a significant sum now paid to institutionalize some of these patients due to their incontinence, as well as funds paid for surgery and absorbent products.

Shapiro held several key positions including, Research Scientist, US Army Signal Corp Laboratory; U.S. Army Commendation Award, Assoc. Professor, Boston University School of Medicine & College of Engineering. He was the Cofounder, Department of Biomedical Engineering, Boston University College of Engineering. He is currently the Mentor, MIT Portugal, Program Committee, Worcester Polytechnic Institute Venture Forum, Member, MassMEDIC, Co-Chair, Life Sciences Special Interest Group, TechSandbox

He has graduate degrees in Electrical Engineering and PhD in Bioengineering and an alumnus of Polytechnic Institute of Brooklyn, Purdue University, West Lafayette, IN and University of Michigan, Ann Arbor, MI

Brigid Oliveri Siegel, Partner, Ward Howell International, Inc., http://www.ward-howell.com

Moderator:

Brigid Siegel is a partner and management consultant at Ward Howell, Inc. where she conducts retained executive searches. In this capacity, she focuses on finding and developing leaders as well as building effective managing teams which will guarantee success in any technology, life sciences or biotech field.

Brigid began her career in the high technology industry over 30 years ago and in executive search, 20 years ago. She was a principal at Brigid Siegel Associates, a partner at Polachi, a Managing Director with The Onstott Group, a Senior Partner at Heidrick & Struggles and a Vice President with Fenwick Partners. Throughout her retained executive search career Brigid has successfully completed numerous senior executive search assignments for clients ranging from emerging growth companies to multi-billion dollar corporations.

Brigid studied at Polytechnic Institute of Brooklyn and holds a Bachelor of Science Degree in Electrical Engineering from Lowell Technological Institute. Her executive search industry expertise has been cited in the Boston Business Journal, the New York Post, as well as Hunt Scanlon's Executive Recruiting Industry Newswire. She was also a member of the Executive Board of the WPI (Worcester Polytechnic Institute) Venture Forum for seven years and is currently a Boston ENET Vice Chairperson and an Executive Board member.

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

Virtualization and Orchestration - For the New Age Telcos

Dr. Azhar Sayeed, Chief Architect at Red Hat

Important Note: Verizon Technology Center requests the names of attendees in advance of the meeting. If you plan to attend, please send a note via e-mail with your name to Bob Malupin at Robert.Malupin@VerizonWireless.com by close of business, Wednesday, April 5th.

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

Meeting Location: Verizon Technology Center, 60 Sylvan Rd., Waltham, MA 02451

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

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

Reliability Society – 5:30PM, Tuesday, 11 April

Focused ION Beam Technology: Applications to Microelectronics

Marsha Abramo, Advisory Engineer – Scientist (Retired), IEEE Distinguished Lecturer
World Wide Analytical Services Laboratory, IBM Systems and Technology Group

Agenda
5:30-6:00 PM: Sign in, refreshments, and personal networking
6:00-6:10 PM: Chapter Chair greetings and announcements
6:10-7:30 PM: Marsha Abramo, IEEE Distinguished Lecturer
7:30-7:45 PM: Q&A session, meeting adjourns

During the past two decades focused ion beam (FIB) systems have become indispensable tools in the arsenal of analytical techniques available to failure analysts and integrated circuit designers. FIB systems are similar to scanning electron microscopes (SEM) in that a charged particle beam is generated, raster scanned, and used for high resolution imaging. In addition, the use of massive Ga ions permits the FIB system to be used for both material removal (milling) and deposition, enabling applications such as precision cross sectioning and circuit modification. This presentation will review the fundamentals of FIB systems, describe a wide range of applications and discuss FIB techniques used for circuit modification and failure analysis. The reliability of FIB modified integrated circuits will also be discussed.

Marsha Abramo received a B.S. in Chemistry from Trinity College, Burlington, VT. She joined the World Wide Analytical Services and Advanced Technology Laboratory at IBM Systems and Technology Group in 1980. As an Advisory Engineer Scientist she was responsible for laboratory development and management, supporting domestic and international clients while providing leadership to a team of failure analysts.

Prior to her retirement in 2008, her primary areas of interest were in microelectronic application development and technology transfer related to plasma and ion beam physics for failure analysis applications. She has authored and co-authored numerous conference papers and journal articles.

She is a senior member of the IEEE and has been an active volunteer supporting technical conferences and workshops for 20 years. She has also served as the Vice President Membership of the IEEE Reliability Society as well as the Vice President for Conferences and Meetings. She is currently serving as a member of the IEEE Reliability Society Administrative Committee and is the society liaison to IEEE Women in Engineering.

Marsha is also currently serving as a member of the Board of Directors of the IEEE International Reliability Physics Symposium and is a member of the Electron Device Failure Analysis Society (EDFAS).

Meeting Location: MIT Lincoln Laboratory, 3 Forbes Road, Lexington, MA
Reservations:
https://events.vtools.ieee.org/m/43896

Women in Engineering – 7:30PM, Wednesday, 12 April

Small Data: A Big Challenge for Classical Machine Learning

Prof. Sarah Ostadabbas, Assistant Professor, ECE

We live in a world inundated with data: websites, mobile devices, security systems, and even small wireless sensor systems constantly collect data. In fact, such systems often collect so much data that traditional data processing techniques are insufficient. This is the big data problem. However, sometimes things go the other way: there is a critical constriction in the size of the data at some point in the processing pipeline that prevents traditional machine learning techniques from working. We call this the Small Data problem. For all but the most simple classification and regression models, traditional machine learning requires a considerable amount of training data to learn a model without overfitting. Unfortunately, for many datasets, especially within medical applications, there is not enough training data for these models to work. There are a number of common reasons for this constriction including: plenty of healthy subjects/ not enough sick subjects, per-person differences that require individualized training, and a high cost of features (such as certain tests or data that costs a lot of money/time to collect).

As an example, collecting data from the following subjects is increasingly problematic as we proceed from right to left: rats, apes, healthy adults, sick adults, healthy children, and sick children. So, ideally, you would want to learn as much from subjects toward the left of the list and try to generalize the knowledge to subjects on the right. But this introduces another aspect of the small data problem: it's not just the amount of data, but the quality. A model learned from rats might break down pretty quickly if applied to a sick child. But there may not be enough data from sick children to adequately train the full model. How do we solve these problems? Like terrible scientists, but great engineers, we cheat: we use as much pre-existing or inexpensively obtained knowledge to constrain the problems to the point where the model is simple enough to be correctly trained with the available data.

Sarah Ostadabbas is a first year assistant professor at the Electrical and Computer Engineering Department of Northeastern University (NEU). Sarah joined NEU from Georgia Tech, where she was a post-doctoral researcher following completion of her PhD at the University of Texas at Dallas in 2014. At NEU, Sarah has recently formed the Augmented Cognition Laboratory (ACLab) with the goal of enhancing human information-processing capabilities through the design of adaptive interfaces via physical, physiological, and cognitive state estimation.

Meeting Location: Northeastern University, Egan Conference Rooms: Egan 306, Egan Research Center, 120 Forsyth Street, Boston, MA 02115

Computer Society and GBC/ACM – 7:00PM, Wednesday, 12 April

Evolution of the Translational Apparatus and Implications for the origin of the Genetic Code

Hyman Hartman

Location: Broad Institute Auditorium, 415 Main St, Cambridge

The translational apparatus involves:
1) The Ribosome; the Large and Small subunits
2) The 20 Aminoacyl -tRNA synthetases
3) The tRNAs

We shall walk thru the evolution of the translational apparatus starting with the ribosome passing thru the Aminoacyl tRNA synthetases and ending up with the origin and evolution of the tRNA. There are one or two surprises in this leisurely walk and we will end up with the Origin of the Genetic Code and the Demise of the RNA World.

Conclusion: The Origin of the Genetic Code implies the Decline and Fall of the RNA world
"It is almost impossible to discuss the origin of the code without discussing the origin of the actual biochemical mechanisms of protein synthesis. This is very difficult for two reasons: it is complex and many of its details are not yet understood." - Francis Crick

Hyman Hartman was born in Montreal, Quebec, Canada. He received his B.Sc with honors In Biochemistry from McGill University (1957) and his PhD in Biochemistry from Columbia University (1964). He began his studies on the Origin of Life by publishing two pioneering papers in 1974 on the Evolution of the Genetic Code and the Origin and Evolution of Metabolism. These papers were based on the Clay theory for the Origin of Life. He edited a book with Graham Cairns-Smith entitled Clay Minerals and the Origin of Life.(1987). He was on the Grant Board for NASA Exobiology Division and he was a co-editor with Jim Lawless and Phil Morrison on the book Search for the Universal Ancestors published by NASA. He and Temple Smith (Boston University) have been studying the Bioinformatics of the Ribosomal Proteins and the Aminoacyl-tRNA Synthetases. These studies have allowed them to reconstruct the Origin and Evolution of the Translational Apparatus and the Origin and Evolution of the Genetic Code. He is also active with a group in the University of Kentucky and McGill University studying the De Novo synthesis of Clay as catalyzed by Amino acids and Dicarboxylic acids.

This joint meeting of the Boston Chapter of the IEEE Computer Society and GBC/ACM will be held in the Broad Institute Auditorium (MIT building NE-30). The Broad Institute is at 415 Main St between Vassar and Ames streets. You can see it on a map at this location. The auditorium is on the ground floor near the entrance.

Up-to-date information about this and other talks is available online at http://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 http://mailman.mit.edu/mailman/listinfo/ieee-cs, our self-administered mailing list.

For more information contact Peter Mager
p.mager@computer.org

Life Members - 4:00PM, Wednesday, 12 April

History and Operation of the Mass State Police Radio System

John Ruggiero, Massachusetts State Police Radio Engineer

About 20 years ago, the MASSACHUSETTS STATE POLICE realized that their existing, 40 year old, Conventional 44 MHz Radio System was not able to provide adequate "through-put", especially on very busy summer weekends or during winter storm events.

In 1989, they started with a new 800 MHz, three site system that had trunked repeaters on Blue Hill, the McCormick Building in Boston and on Turkey Hill in Arlington. The initial system was designed to provide coverage only to mobiles inside the Route 128 area. The system was then expanded in 1994 to provide mobile coverage inside I-495, including additional fixed repeaters in Andover, Essex, Georgetown, Chelmsford, Sudbury, and Wrentham. Specialized coverage of the Ted Williams Tunnel was added in1996. Coverage of Plymouth and Bristol Counties was added with six additional radio sites in 1998.

The new 800 MHz system uses a network of Central Control computers that allocate a "shared" radios channels in a manner that is similar to the technology that was used to allocate toll telephone trunks.

Biographical Sketch of John Ruggiero: John graduated from Worcester Polytechnic Institute with a degree in Electrical Engineering and has over 15 years' experience with the State Police as MSP Radio Engineer.

John has played a pivotal role in several missions, including serving as technical coordinator for the 800 MHz "Rebanding" effort and responding to the Town of Monson in June 2011 to establish communications after the police department was destroyed by a tornado. John also responded with a team of COM-L's to Suffolk County (Long Island) New York in the days after Superstorm Sandy, assisting local, state, and federal agencies to re-establish communications systems after the storm destroyed the existing infrastructure; initially there were no hotel rooms available, so he slept in his truck for the first two days.

In addition, John was a member of a small and dedicated MSP communications contingent present at the Boston Marathon finish-line in April 2013. He was volunteering (as a Ham Radio coordinator) on that day, but quickly jumped into action and played an important role to establish communications capabilities at the Westin Hotel Command Post immediately following the explosions. He responded with CP-1 when the manhunt operation was underway in Watertown on 4/19/13.

The meeting will be held at the Lincoln Lab Auditorium, 244 Wood Street. Lexington, MA at 4:00 PM. Refreshments will be served at 3:30 PM.

Registration is in the main lobby. Foreign national visitors to Lincoln Lab require visit requests. Please pre-register by e-mail to reception@ll.mit.edu and indicate your citizenship.

Please use the Wood Street Gate. For directions go to http://www.ll.mit.edu/; for other information, contact Steve Teahan, Chairman, at (978)763-5136, or Steve.F.Teahan@raytheon.com

Power and Energy Society – 6:00PM, Tuesday, 18 April

MIT's Utility of the Future: A framework for Enabling the Efficient Evolution of Electric Power Systems

Speakers: Scott Burger, PhD candidate, Institute for Data, Systems, and Society at MIT; advisor to the PRIME Coalition

Max Luke, Lead, modeling and analytics team at the New York State Energy Research and Development Authority (NYSERDA)

Refreshments start at 6pm, talk commences at 6:30pm

Meeting Location: National Grid, 40 Sylvan Road, Waltham, MA 02451 (Rooms: Valley A&B)

Important changes are now affecting the distribution side of electric power systems. Emerging distributed energy technologies are creating new options for the provision and consumption of electricity services. At the same time, information and communications technologies are becoming ubiquitous, enabling more flexible and efficient consumption of electricity, improved visibility of network use, and enhanced control of power systems. The MIT Energy Initiative's Utility of the Future study report presents a framework for proactive regulatory, policy, and market reforms designed to enable the efficient evolution of power systems over the next decade and beyond. Researchers will present the study's key findings and recommendations related to reforms in pricing of electricity services, regulation of distribution networks, and market design to respond to the evolving sector and achieve substantial cost savings for consumers and industry.

Scott Burger is a Ph.D. candidate in the Institute for Data, Systems, and Society at MIT, where he focuses on developing engineering models to explore the economics of distributed energy resources and the development of tariffs for 21st century power systems. Scott is an MIT Energy Initiative Fellow and was a lead researcher with MITEI's Utility of the Future Project focused on the optimal deployment and regulation of distributed energy technologies within the electricity system. While at MIT, Scott IEEE PES TECHNICAL MEETING: MIT's Utility of the Future: A framework for enabling the efficient evolution of electric power systems Free and Open to the Public Visit the IEEE PES Boston Chapter website for further details - http://www.ieeepesboston.org/ served as the Managing Director of the MIT Clean Energy Prize.

Scott is currently an advisor to the PRIME Coalition, where he previously served as the Director of Operations. As PRIME's Director of Operations, Scott oversaw all of PRIME's investment operations, working with PRIME's Investment Committee to "boil the ocean" to identify the most promising early stage clean energy ventures that are fit for philanthropic investment.

Before MIT, Scott led GTM Research's global downstream demand practice, and led GTM's entry into the Middle Eastern and Japanese markets. Before GTM Research, Scott was the Director of Engineering for Circular Energy, a solar PV engineering, procurement and construction firm based in Austin, TX (acquired). During his tenure at Circular, Scott oversaw the engineering department as the organization's revenue doubled. Scott holds a B.S. with distinction in Chemical Engineering from Washington University in St. Louis, and an S.M. in Technology and Policy from MIT.

Max Luke currently leads a small modeling and analytics team at the New York State Energy Research and Development Authority (NYSERDA), where he and his team provide analysis that will aid New York State in achieving its clean energy goals and its transition to modern electricity systems. Prior to NYSERDA, Max completed a Master's of Science degree in Technology and Policy at MIT, where his research was focused on helping electricity network planners assess trade-offs between using traditional investments and innovative solutions to mitigate anticipated network challenges. Max was also a researcher on the MIT Energy Initiative's Utility of the Future Study, where he made significant contributions to the chapters that are focused on state-of-the-art regulatory practices for distribution network operators and planners. Max will be beginning a Ph.D. in electrical engineering at New York University in the fall, where his research will be focused on animating markets for distributed energy resources.

Meeting Location: National Grid, 40 Sylvan Road, Waltham, MA 02451 (Rooms: Valley A&B)

Free and Open to the Public Visit the IEEE PES Boston Chapter website for further details - http://www.ieeepesboston.org/

Call for Articles

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

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

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

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

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

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

Submissions should be sent to; ieeebostonsection@gmail.com

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

Raising Money from Crowdfunding

Location: Pivotal Labs, 145 Broadway, Cambridge

Crowdfunding has proven itself to be an amazing way to raise capital for a variety of projects.

You have seen one of the many projects building new computing devices, air conditioners, furniture, accessories for mobile devices, art projects, and video games.

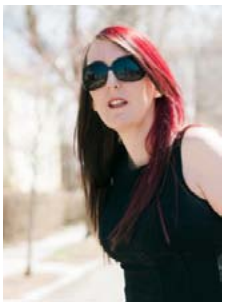
Today, most of the crowdfunding processes have been reward or donation based. Thanks to the regulation changes in the jobs act of April 2012, it is now possible to do crowdfunding based on securities or equity

As we celebrate the successes in crowdfunding and all the new products launched through this new funding mechanism, we need to be aware of the fact that only 35% of all crowdfunding project succeed. The rest fail and depending on the portal, you may or may not get your money back. With equity based funding, it's going to become even more difficult for the crowdfunding participant to understand the risk to their investment.

We've invited our speakers tonight to talk about their experience with crowdfunding, and share instances of what they did right, what they desperately wish they could do over, and how the new equity based crowdfunding process will change how you develop products and your responsibility to investors.

Come and get your questions answered. Hear from the practitioners who have implemented crowd funding methods. Network with like minded entrepreneurs.

Speakers:



Brianna Wu - Head Software Development at Giant Spacekat

Brianna Wu is head of software development at Giant Spacekat a company specializing in cinematic experiences using the Unreal engine. She's also a frequent speaker on women-in-tech issues. In the past, she's worked as a journalist and a politico. When she's not developing software, she enjoys racing motorcycles and running marathons. She is a national figure for women in tech. She's running for US Congress in 2018 for district 8 in Massachusetts.

John Sundman - Novelist and essayist

John Sundman's career has included long stints as technical writer, and as manager of information architecture, software engineering and QA for various concerns in Silicon Valley, New York, and the greater Boston area. He resides on Martha's Vineyard where he is a volunteer firefighter and construction worker. His next novel will be appearing Real Soon Now.

Organizer:

Eric Johansson, Principal Consultant at in3x inc

Eric Johansson is info systems and user experience designer specializing in industrial domains. His career has spanned many industries ranging from industrial controllers, produce wholesalers, and telecommunications.

Photonics, and Aerospace and Electronic Systems Societies; joint meeting with New England Section of OSA – 5:45PM, Thursday, 20 April

Quantum Limits of Optical Imaging

Dr. Saikat Guha - Raytheon BBN Technologies

The fundamental limits of optical information processing — be it the maximum rate of reliable communications, resolution of an optical imager, or the computational power of an optical computer — are ultimately governed by the laws of quantum mechanics. Most conventional systems, which do not exploit the manifestly quantum effects of light, are limited to performance inferior to these limits. In this talk, I will discuss a few simple illustrative problems in active and passive optical imaging, where exploiting quantum effects — either by using quantum illumination of the scene, or by employing non-standard all-optical pre-detection processing locally at the receiver (or both) — can yield improved performance over a classical imager that uses the same transmit power and optical bandwidth. I will discuss general characteristics of imaging scenarios where quantum improvements can be expected to be had, and the respective natures of enhancements in imaging performance. I will conclude with some theoretical open problems and photonic-device challenges that will need addressing to realize the aforesaid enhancements.

Saikat Guha is a Lead Scientist with the Quantum Information Processing group at Raytheon BBN Technologies (BBN). He received his Bachelor of Technology degree from the Indian Institute of Technology (IIT) Kanpur in 2002, and his Masters and Ph.D. degrees from the department of Electrical Engineering and Computer Science (EECS), Massachusetts Institute of Technology (MIT) in 2004 and 2008 respectively. Saikat represented the Indian team at the International Physics Olympiad in 1998, where he received the European Physical Society (EPS) award. He leads several projects, funded by DARPA, ONR, NSF, DoE, and ARL, on topics surrounding fundamental limits of photonic information processing, with applications to optical communications, sensing and computation. He received the Raytheon 2011 Excellence in Engineering and Technology Award, Raytheon's highest technical honor, for work his team did on the DARPA-funded Information in a Photon program. He was a co-recipient of an honorable mention in NSA's 2016 Cybersecurity Best Paper Award for his work on Quantum-Secured Covert Communications.

5:45PM – Networking
6:45PM – Dinner RSVP Only
7:30PM – Meeting

This meeting begins at 7:30 PM Thursday April 20th, 2017 and will be located at 3 Forbes Road (a MIT Lincoln Laboratory facility), Lexington, MA, 02420. The meeting is free and open to the public. All are welcome.

NES/OSA requests that you RSVP for the meeting by April 19 (dinner by April 17) at http://nesosa.org/meetings/meeting-signup/signup?cyc=yes&mdate=20170420&cdate=20170417

Prior to the seminar there will be social time and networking starting at 5:45 PM. Dinner is by reservation only, and must be done before April 17 @ 6 PM using the above registration link. The seminar will begin at 7:30PM. For more information contact Ajay Garg, Boston IEEE Photonics Society chapter chair at ajay.garg@ll.mit.edu, or visit either the NES/OSA website at www.nesosa.org or Boston IEEE Photonics Society website at www.bostonphotonics.org.

IMPORTANT NOTE: This meeting will be held at the Forbes Road site for MIT Lincoln Laboratory as the Cafeteria is not available due to heightened security at the main MIT-LL site.

The address is: 3 Forbes Road, Lexington, MA 02420 (about 1.5 miles south of the main MIT-LL site) and a map is available at: http://www.ll.mit.edu/about/mapForbesRoad.html.

Entrance is by the flags.

Consultants Network – 6:30PM, Tuesday, 25 April

Panel Discussion - Everything You Wanted to Know About Consulting But Were Afraid to Ask

Where: Constant Contact, 1601 Trapelo Road, Waltham, MA 02451

A panel discussion consisting of 5 consultants who will share their experiences and tips on how best to consult.
Topics covered will include:

- Specialization vs. generalization
- On site vs. off site
- Your tools vs. client's tools
- Proposals
- Record keeping
- Corp, Sole proprietorship, or partnership
- 1099, Corp to Corp, or, W2
- Consulting, contracting, and employees
- Pitfalls and traps to avoid

The session will be an open discussion and questions are encouraged.

Panel Members:
Craig Goldman, CoAutomation, Inc.
info@coautomation.com

Steve Golson, Trilobyte Systems
sgolson@trilobyte.com

Larry Nelson, Nelson Research, l.nelson@ieee.org

Larry Rachman, Innovation Design and Solutions, Inc, larryr@4innovation.biz

Moderator: Ronald Goodstein, First Shot Logic Simulation and Design, info@firstshotlogic.com

PLEASE NOTE: The meeting is open to the public. No charge for Consultants Network members or employees of Constant Contact; $5 entrance fee for all others. Casual dress. Registration (no registration required).

The Consultants Network meeting starts at 6:30 PM. The meeting will take place at Constant Contact, Reservoir Place - 1601 Trapelo Road, Waltham, MA 02451. A no host, PRE-MEETING DINNER will take place at 5:15 PM (sharp) at Bertucci's, 475 Winter Street, Waltham, MA 02451 (exit 27B, Rte 128).

Driving Directions
To Bertucci's: Follow I-95/route 128 to Winter St in Waltham. Take exit 27B from I-95/Route 128. Turn left on Wyman S, then left on Winter St. Bertucci's is the 1st right after crossing the bridge over I 95/Route128.

To Constant Contact: Follow I-95/route 128 to Trapelo Rd in North Waltham, Waltham. Take exit 28 from I 95/route 128. Constant Contact is the 1st right after crossing the bridge over I 95/Route128. Consultants Network meetings generally take place on the fourth Tuesday of each month, but are not held during the summer months. Check the Consultants Network website for meeting details and last-minute information.

For more information, e-mail or chairman@boston-consult.com

IEEE Region One is accepting nominations for Professional Awards
(Deadline is April 19, 2017).

http://sites.ieee.org/r1/r1-awards/r1-awards-2/

Geoscience and Remote Sensing Society – 6:00PM, Thursday, 27 April

Physics / Data / Robotics: Pushing the Frontiers of Oilfield Technology

Dr. Julius Kusuma, Schlumberger-Doll Research Center

This talk is an overview of how physics, data, and robotics play a key role in the oilfield domain at every scale, from in-situ measurement of geophysical and petrophysical properties to smart drilling solutions; from reservoir modelling to production optimization. Interdisciplinary advances in science and engineering are cornerstones in enabling these showcases, with particular emphasis on electrical engineering innovations in signal processing, analysis, and control systems.

Julius Kusuma joined Schlumberger in 2006, where he is a Program Manager and a Principal Scientist with the Schlumberger-Doll Research Center in Cambridge, MA. His research focuses on communication and signal processing systems for oilfield applications, including mud pulse telemetry, acoustic telemetry, data compression, and underwater communication. He received the B.S.E.E. degree (highest distinction) from Purdue University, the M.S.E.E. degree from the University of California, Berkeley, CA, USA, and the Ph.D. degree from the Massachusetts Institute of Technology, Cambridge, MA, USA, in 2006, where he was an MIT Presidential Fellow. He was a recipient of the Rappaport Scholarship Award and the Demetri Angelakos Memorial Award.

Meeting Location: MIT Lincoln Laboratory, 3 Forbes Rd, Lexington, MA 02421

Education and, Signal Processing Society and Women in Engineering – 6:00PM, Monday, 24 April

Emerging Technologies for Healthcare, Cybersecurity and Judiciary Engineering

Whether you are an engineer, medical physician, policy maker, legal professional or health care provider, technology is removing discipline specific boundaries and enhancing knowledge building capabilities. This has led to new innovative breakthroughs in healthcare, safety and security. Furthermore, the social implications and benefits of this interdisciplinary work is having a tremendous impact on attracting and retaining diverse groups of individuals into the Science, Technology, Engineering and Mathematics (STEM) fields, including women and other underrepresented groups of individuals.

Together, MITRE, The Tufts School of Engineering and the IEEE Boston Section invite you to meet experts and leaders from MITRE and learn firsthand about these exciting game changing technologies. There will be short technical presentations followed by a panel discussion. Attendees are welcome to bring a resume.

Hostess: Dr. Karen Panetta, IEEE Fellow, Associate Dean for Graduate Engineering Education, Tufts University. Email: Karen@ieee.org

Meeting Location: Tufts University, 51 Winthrop Street, Medford, MA 02155. A Buffet Dinner will be served and is FREE.

Registration is required and space is limited.
When registering, please specify in the “Special Requests” field if you are a Tufts or IEEE attendee.

https://events.vtools.ieee.org/m/44718

Parking: Tufts University Dowling Parking Garage, 419 Boston Ave.

2017 IEEE WIE USA EAST FORUM

Call for Participation

November 30 – December 2, 2017 Baltimore, MD

Presentation Topics

- Mentoring the next generation of female leaders
- Strategies for increasing equity in power and decision making
- Women as leaders in education, industry, and government
- Development: communication skills in written and spoken word, effective dialog
- Cross-cultural aspects of leadership
- What it takes to be a great leader - qualities that all successful leaders share
- Shaping the future by female leaders
- Training vs inherent skills: can leadership be learned?
- Work-Life balance: family systems traditions and changes
- Leadership development for women: overcoming stereotypes
- The design, implementation, and evaluation of leadership from a structural perspective
- Helping girls and young women become leaders - motivating to empower, empowering to motivate
- Exploring the attrition gap - why do women leave the engineering field and what can be done to prevent it

Submission Deadline

Presentation topic abstract suitable for program (up to 150 words), and extended abstract for evaluation (up to 2 pages) due 24 July 2017.

For more information, visit:
http://sites.ieee.org/wie-forum-usa-east/calls-for-participation/

IEEE WIE FORUM USA EAST 2017 IEEE IEEE-USA

EDI CON BOSTON 2017

September 11-13
Hynes
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Call for Papers Now Open!

Abstracts due:
April 3, 2017

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All accepted and submitted papers considered for an Outstanding Paper Award and eligible for publication online in Microwave Journal and/or Signal Integrity Journal.

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Low Power RF & IoT
5G Advanced Communications
Broadband Networks
Radar & Defense
Amplifier Design
Signal Integrity
Power Integrity
Electromagnetic Integrity
Simulation & Modeling
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EDI CON is where high-frequency meets high speed: what's similar, what's different, and how we can learn from each other.
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component and system simulation ■ materials/PCB boards ■ devices and foundry services ■ components
cables and connectors ■ test and measurement ■ verification ■ RF and microwave ■ 5G ■ IoT
autonomous cars ■ radar ■ signal integrity ■ power integrity ■ EMC/EMI

Call for Submissions

Submission Deadline: June 30th, 2017

Envisioning a technical conference targeted towards undergraduate students all over the globe, the MIT IEEE Student Branch in 2015 inaugurated the IEEE MIT Undergraduate Research Technology Conference. This year we are organizing it again with the goal to make the conference a venue where undergraduate students can meet to present, discuss, and develop solutions advancing technology for humanity. Participants can attend a rich program with renowned speakers, technical sessions, a student design competition, exhibits, networking, and social activities, presenting a great opportunity for students to interact with leading industry experts.

The conference theme is "Meet Innovative Technology", and the six fields of focus are:

1. Machine Learning / Artificial Intelligence (AI)
2. Biological and Biomedical Engineering and Technology (BioEECS)
3. Robotics and Automation Technology
4. Systems and Networking
5. Embedded Technologies
6. Innovative Technologies and Others

Authors may submit content in the form of a technical paper, poster, or lightning talk.

All submissions must be written in English. Paper submissions must be no longer than 4 pages, single-spaced, with a minimum font of 10 point, and submissions may include figures, illustrations, and graphs. Abstract submissions for the poster and lightning talk are limited to 500 words.

All submissions will be peer-reviewed. Submissions are online, with a deadline of June 30th, 2017. Notification of acceptance will be sent via email by August 4th, 2017.

Please join the mailing list (MIT-Conference@ieee.org) for more information and updates on submission, the technical program, registration, and accommodation.

A conference proceeding of all the accepted papers that have been presented at the conference may be published and included in the IEEE Xplore journal. Electronic and online media containing all accepted submissions will be distributed to all registered attendees.

Meet Innovative Technology

Sponsored by MIT IEEE Student Branch and IEEE Boston Section

http://ieee.scripts.mit.edu/conference

Massachusetts Institute of Technology

IEEE BOSTON SECTION

Software Development for Medical Device Manufacturers *(Online Edition)*

New Online Course

Students have access to this self-paced course for 90 days!!

Course Description This course provides an introduction to the development of medical device software. The course is comprised of 4 modules that range from 30-45 minutes in duration. The focus is on complying with FDA Design Controls and IEC 62304 requirements.

This course is intended for software developers who are actively involved in developing medical device software.

Module 1
- Medical Device Definitions: FDA and European Union (EU)
- Regulatory Roadmap
- FDA/EU Device Classifications
- FDA QSR Regulation
- FDA Guidance Documents that pertain to medical device software

Module 2
- International Standards that pertain to medical device software
- Types of Software Regulated by FDA
- Quality System basics: Procedures, Work Instructions and Records
- ALL Software is Defective…

Module 3:
- Design Control Overview
- General Requirements
- Design and Development Planning
- Software Development Models
- Design Input
- About Requirements…
- Design Output
- Design Reviews

Module 4:
- Design Control (continued)
- Design Verification
- Software Verification Process
- Testing Overview
- Design Validation
- Software Validation Process
- Design Changes
- Design Transfer
- Design History File
- Course Summary

Speaker Bio:
Steven R. Rakitin has over 40 years experience as a software engineer including 25 years of experience in the medical device industry. He has worked with over 85 medical device manufacturers worldwide, from startups to Fortune 100 corporations. He has written several 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 and a member of MassMEDIC. He is on the Editorial Review Board for the ASQ Journal Software Quality Professional.

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

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

Fundamental Mathematics Concepts Relating to Electromagnetics (*Online Edition*)

New Online Course

Students have access to this self-paced course for 90 days!!

Course Summary This course is designed for people wishing to refresh or to learn the fundamental mathematical concepts that are used to describe electromagnetic wave behavior. The modules address all of the basic math concepts covered in a traditional undergraduate electromagnetics course in an ECE curriculum. These concepts include Vector Basics, Integral Vector Calculus, Differential Vector Calculus, Fundamental Coordinate Systems and Complex Numbers. After completing these modules, a person should have sufficient math skills to pursue graduate studies in electromagnetics and/or be able to decipher the math presented in an upper-level text on the subject.

Target audience: This course is designed for people wishing to refresh or to learn the fundamental mathematical concepts that are used to describe electromagnetic wave behavior.

Course chapters

1. Vector Basics
2. Dot Product
3. Cross Product
4. Contour Integration
5. Vector Algebra
6. Surface Integration
7. Metric Coefficients
8. Coordinate Systems
9. Vector Coordinate Conversion
10. Del Operator and the Gradient
11. The Curl
12. Divergence
13. Stokes Theorem
14. Divergence Theorem
15. Laplacian
16. Complex Numbers

Instructor's Bio:

Dr. Kent Chamberlin is the Chair and a Professor in the Department of Electrical and Computer Engineering. In his more than thirty-five years in academia, he has performed research for more than twenty sponsors, including the National Science Foundation. He has received two Fulbright awards, including the prestigious Fulbright Distinguished Chair, which he served in Aveiro, Portugal. He has also served as an Associate Editor for the Institute for Electrical and Electronics Engineers, and he continues to be active in performing and publishing in a range of research areas.

http://ieeeboston.org/fundamental-mathematics-concepts-relating-electromagnetics-line-course/

Reliability Engineering for the Business World *(Online Edition)*

Students have access to this self-paced course for 90 days!!

Course Description

This course is about becoming a leader in reliability engineering. While statistics are the tools of reliability engineering, it takes knowledge not only of these tools but also of the business. Developing knowledge of the business, from sales, engineering, customer service, to supply chain management can determine how effective you can be in improving reliability.

Never take anything for granted, even some rules of thumb in reliability can be misleading, this course will show you how to prove what truly happens in the real world and how to effect change in any part of the business where it is needed. We will explore the balance sheet, organizational structure, customers, service, and high volume manufacturing. It's not just about how often things fail, it is also about where the defect came from, what is the financial effect, the recovery, when should a business take field action, effect of human error, failure analysis/material science, reliability testing, and much more. I will also discuss how you develop executive buy in for change. The course assumes a basic knowledge in reliability statistics. There are 12 sessions that cover the following topics.

Course Outline

Basics – Measurements
Business Model
Design Model (HW and SW)
HALT/RDT/Predictions
Manufacturing Model
Early Life Failures
Wear Out and Mid Life Crisis
Advanced Reliability

Course Objective

To teach you how to become the go to person in your business for objective business sensed reliability answers and requirements.

Instructor's Bio

Kevin is an innovative leader in reliability methodologies with more than 30 years experience in the storage industry. In his latest role as Director of Engineering, he developed a top down reliability/availability management process for design organizations developing mission-critical storage systems. Kevin previously directed the most extensive HALT/HASS operation in the industry, with over 300 chambers worldwide. He has written several papers, consulted with many companies, 3 patents awarded and 2 pending related to systems reliability and test.

His most recent work has been performing system architectural analysis to optimize system availability, serviceability and costs. Providing guidance to development to maximize system reliability and reduce service costs. He has provided consultation to many large companies such as EMC, CISCO, AT+T, HP, Seagate and many others. His position and experience has enabled him to perform extensive field studies and design of experiments. Kevin has developed many

http://ieeeboston.org/reliability-engineering-business-world-line-course/

Introduction to Embedded Linux – Part I
(Online Edition)

New Online Course

Course Summary:
This first of a 2-part series introduces the Linux Operating System and the use of Embedded Linux Distributions. The course focuses on the development and creation of applications in an Embedded Linux context using the Eclipse IDE. The first part of the course focuses on acquiring an understanding of the basic Linux Operating System, highlighting areas of concern for Embedded Linux applications development using Eclipse. The latter part covers the methods for booting Embedded Linux distributions including embedded cross-development and target board considerations.

Who Should Attend:
The course is designed for real-time engineers who are building Embedded Linux solutions. It is also targeted at experienced developers requiring a refresher course on Embedded Linux. This course will clearly demonstrate both the strengths and weaknesses of the Linux Operating System in Embedded Systems.

Course Objectives:
To provide a basic understanding of the Linux OS and the Eclipse IDE framework.
To gain an understanding of the complexities of Embedded Linux Distributions and their use in embedded systems.
To give students confidence to apply these concepts to their next Embedded Linux project
Hardware and Software Requirements

The student should have a working Linux desktop environment either directly installed or in a virtualization environment. The desktop Linux should have the GNU compiler and binary utilities (binutils) already installed. A working Eclipse C/C++ installation or prior knowledge of C-based Makefiles is useful for completion of lab exercises. Lab solutions are also provided with the course. An Embedded Linux target hardware platform is useful but not absolutely required for this course.

Additional Reference Materials
Linux Kernel Development by Robert Love
Linux System Programming by Robert Love
Linux Debugging and Performance Tuning by Steve Best
Optimizing Linux Performance by Phillip G. Ezolt
Embedded Linux Primer by Christopher Hallinan
Pro Linux Embedded Systems by Gene Sally
Embedded Linux Development Using Eclipse by Doug Abbott
Linux Device Drivers by Jonathan Corbet et al
Essential Linux Device Drivers by Sreekrishnan Venkateswaran
Course Downloadable Content:

Video Lecture
Hands-On Lab Instructions
Hands-On Lab Solutions
Additional Related Materials

The Basics
Linux Terminology, History and Versioning
The Linux Community: Desktop & Embedded
The GPL
Linux References (Books and Online)

Getting Started
Kernel Source Code
Building the Kernel
Embedded Linux Kernels
Linux 2.6

Basic Kernel Capabilities
Process and Threads Management

Signals and System Calls
Synchronization, IPC and Error Handling
Timing and Timers
Memory Management and Paging
The I/O Subsystem: A Tale of Two Models
Modularization

Debugging
Process-Level and System-Level Debug
GDB and KGDB
GDB Server and Remote Debugging

An Eclipse Debug Example
Other Debug and Test Tools
Other System-Level Debug Approaches
Process & Threads Management
What are Processes and Threads?
Virtual Memory Mapping
Creating and Managing Processes and Threads
Thread-Specific Data (TSD) POSIX
The Native POSIX Threading Library (NPTL)
Kernel Threads

Signals
System Calls
Scheduling
Linux 2.4 and 2.6 Scheduling Models
The O(1) Scheduler
The Completely Fair Scheduler (CFS)

Synchronization
Via Global Data
Via Semaphores, Files and Signals

Inter-Process Communications (IPC)
Message Queues
Semaphores Revisited
Shared Memory
Pipes, FIFOs and Futexes
Remote Procedure Calls
Networking

Error Handling
errno and perror
strerror and strerror_r
oops, panics and Segmentation Faults

Timing
How Linux Tells Time
Kernel, POSIX and Interval Timers
High-Resolution Timers (HRTs)

Memory Management and Paging
Demand Paging and Virtual Memory
Allocating User and Kernel Memory
Mapping Device Memory
The Slab Allocator
The OOM Killer
Memory in Embedded Systems

Modularization
Creating a Module and Module Loading
Dependency Issues
In Embedded Systems

Shared Libraries
A Shared Library Example
Static and Dynamic Libraries

The I/O Subsystem: A Tale of Two Models
The Original Device Driver Model
The Standard I/O Interface
The New Device Driver Model and Kernel Object Classes
Initialization
Platform Devices, Busses, Adapters and Drivers
Comparing the Two Models

Embedded Linux Trends
Development, Monitoring and Testing

Some Final Recommendations

Lecturer:
Mike McCullough is President and CEO of RTETC, LLC. Mike has a BS in Computer Engineering and an MS in Systems Engineering from Boston University. A 20-year electronics veteran, he has held various positions at Tilera, Embedded Planet, Wind River Systems, Lockheed Sanders, Stratus Computer and Apollo Computer. RTETC, LLC is a provider of Eclipse-based development tools, training and consulting for the embedded systems market.

http://ieeeboston.org/introduction-to-embedded-linux-part-i-el201-online-course/

60th IEEE International Midwest Symposium on Circuits and Systems

Boston, MA, USA | August 6th-9th, 2017
www.mwscas2017.org

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CALL FOR PAPERS IEEE INTERNATIONAL MWSCAS 2017

The IEEE International Midwest Symposium on Circuits and Systems is the oldest Circuits and Systems Symposium sponsored by IEEE. The 60th edition will be held on the campus of Tufts University, Boston, MA, USA, August 6 - 9, 2017. MWSCAS 2017 will include oral and poster sessions, student paper contest, tutorials given by experts in circuits and systems topics, and special sessions. Topics include, but are not limited to:

Track 1. Analog Circuits and Systems I
- 1.1 Analog Circuits
- 1.2 Analog Systems
- 1.3 Biomedical Electronics
- 1.4 Bioengineering Systems and Bio Chips
- 1.5 Other Analog Circuits and Systems

Track 2. Analog Circuits and Systems II
- 2.1 Linear Analog Systems
- 2.2 Non-linear Analog Systems
- 2.3 System Architectures
- 2.4 Neuromorphic Systems

Track 3. Digital Circuits and Systems I
- 3.1 Digital Integrated Circuits
- 3.2 System On a Chip (SOC) and Network on a Chip (NOC)

Track 4. Digital Circuits and Systems II
- 4.1 Digital Filters
- 4.2 Hardware-Software Co-Design
- 4.3 Other Digital Circuits and Systems

Track 5. Communications Circuits and Systems
- 5.1 Communications Circuits, Computers and Applications
- 5.2 Communications Systems and Control
- 5.3 Information Theory, Coding and Security
- 5.4 Communications Theory
- 5.5 Other Communications Circuits and Systems

Track 6. RF and Wireless Circuits and Systems
- 6.1 RF Front-End Circuits
- 6.2 Mixed-Signal RF and Analog and Baseline Circuits
- 6.3 Wireless Mobile Circuits and Systems and Connectivity
- 6.4 VCO's and Frequency Multipliers, PLL's and Synthesizers
- 6.5 Other RR and Wireless Circuits and Systems

Track 7. Sensor Circuits and Systems
- 7.1 Technologies for Smart Sensors
- 7.2 Sensor Fusion
- 7.3 Control Systems
- 7.4 Mechatronics and Robotics
- 7.5 Other Sensor Circuits and Systems

Track 8. Converter Circuits and Systems
- 8.1 Analog to Digital Converters
- 8.2 Digital to Analog Converters
- 8.3 DC-DC Converters
- 8.4 Other Converter Circuits and Systems

Track 9. Signal and Image Processing
- 9.1 Analog and Mixed Signal Processing
- 9.2 Digital Signal Processing
- 9.3 Signal Processing Theory and Methods
- 9.4 Image, Video and Multi-Dimensional Signal Processing
- 9.5 Other Signal and Image Processing

Track 10. Hardware Design
- 10.1 Processor and Memory Design
- 10.2 MEMS/NEMS
- 10.3 Nano-Electronics and Technology
- 10.4 Optics and Photonics
- 10.5 Power Management, Power Harvesting and Power Electronics
- 10.6 Photovoltaic Devices/Panels and Energy Harvesting

Track 11. Hardware Security
- 11.1 Hardware Authentication and Physically Unclonable Functions (PUFs)
- 11.2 Trusted Microelectronics
- 11.3 Hardware Anti-Tamper
- 11.4 Architectural System Security
- 11.5 Other Hardware Security

Prospective authors are invited to submit a full paper (4 pages) describing original work. Only electronic submissions will be accepted. Papers should include title, abstract, and topic category from the list above in standard IEEE two-column format for consideration as lecture or poster. Both formats have the same value, and presentation method will be chosen for suitability. All submissions should be made electronically through the MWSCAS 2017 web site (http://www.mwscas2017.org). Students are encouraged to participate in the best student paper award contest. Accepted papers will be published in the conference proceedings subject to advance registration of at least one of the authors.

IMPORTANT DATES

March 18: Tutorial and Special Session proposals deadline
March 18: Regular and Student paper submission deadline
April 1: Special session and invited paper submission deadline
April 29: Notice of acceptance
May 20: Final camera-ready paper deadline

www.mwscas2017.org

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CALL FOR PAPERS

www.ieee-hpec.org

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The IEEE High Performance Extreme Computing Conference (HPEC '17) will be held in the Greater Boston Area, Massachusetts, USA on 12 – 14 September 2017. The HPEC charter is to be the premier conference in the world on the confluence of HPC and Embedded Computing.

The technical committee seeks new presentations that clearly describe advances in high performance extreme computing technologies, emphasizing one or more of the following topics:

- Advanced Multicore Software Technologies
- Case Studies and Benchmarking of Applications
- Automated Design Tools
- Mapping and Scheduling of Parallel and Real-Time Applications
- Computing Technologies for Challenging Form Factors
- ASIC and FPGA Advances
- Open System Architectures
- Data Intensive Computing
- Big Data and Distributed Computing
- Interactive and Real-Time Supercomputing
- Graph Analytics and Network Science
- Fault-Tolerant Computing
- Embedded Cloud Computing
- Digital Front Ends
- General Purpose GPU Computing
- Advanced Processor Architectures
- Secure Computing & Anti-Tamper Technologies
- New Application Frontiers
- High Performance Data Analysis
- Cloud HPEC
- Big Data Meets Big Compute

HPEC accepts two types of submissions:

1. Full papers (up to 6 pages, references not included), and
2. Extended abstract (up to 2 pages, references included).

IMPORTANT DATES:

Submission Deadline: **May 19, 2017**
Notification of Acceptance: **June 16, 2017**

Preference will be given to papers with strong, quantitative results, demonstrating novel approaches or describing high quality prototypes. Authors of full papers can mark their preference for a poster display or an oral presentation. Presenters who wish to have hardware demonstrations are encouraged to mark their preference for a poster display. Accepted extended abstracts will be displayed as posters. All paper and extended abstract submissions must use the approved IEEE templates. Full paper submissions with the highest peer review ratings will be published by IEEE in the official HPEC proceedings available on IEEE eXplore. All other accepted submissions and extended abstracts are published on ieee-hpec.org. Vendors are encouraged to sign up for vendor booths. This will allow vendors to present their HPEC technologies in an interactive atmosphere suitable for product demonstration and promotion.

We welcome input (hpec@ieee-hpec.org) on tutorials, invited talks, special sessions, peer reviewed presentations, and vendor demos. Instructions for submitting will be posted on the conference web site shortly.

Practical Antenna Design for Wireless Products

An intensive Two-day Workshop

Time & Date: 9AM - 4:30PM, Thursday & Friday, June 1 & 2

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

Speakers: Henry Lau, Lexiwave Technology

INTRODUCTION

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

COURSE OBJECTIVES

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

WHO SHOULD ATTEND

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

OUTLINE

Day 1 (1 June)
Fundamental Concepts
1. Antenna Fundamental
* Basic types of Antenna
* Dipole, Monopole, helical, loop, printed PCB
* Radiation Mechanism
* Source of radiation
* Characteristics of radiation

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

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

Day 2 (2 June)
Advanced Antenna Elements
4. Miniature antenna for portable electronics
* Patch, inverted-L, inverted-F
* Meandered line, multi-band
5. CAD Design and Simulation
* CAD tools

* Design strategies
* Limitations
* Case studies

Practical implementation strategies

6. How to design good antennas

* Understand the requirements
* Selection of antenna type, size and geometry
* Location and placement

7. Team work with product designers, electronic engineers and mechanical engineers

* Why it matters
* Case studies on designing good antennas

EXPERTISE

Henry Lau received his M.Sc. and MBA degrees from UK and USA respectively. He has more than 26 years of experience in designing RF systems, products and RFICs in both Hong Kong and US. He worked for Motorola and Conexant in US as Principal Engineer on developing RFICs for cellular phone and silicon tuner applications. Mr Lau holds five patents all in RF designs. He is currently running Lexiwave Technology, a fables semiconductor company in Hong Kong and US designing and selling RFICs, RF modules and RF solutions. He has also been teaching numerous RF-related courses internationally.

Decision (Run/Cancel) Date for this Course is Monday, May 22, 2017

Payment received by May 17
IEEE Members $405
Non-members $435

Payment received after May 17
IEEE Members $435
Non-members $455

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

Simulink Model based FPGA Digital Design and Digital Signal Processing

Time & Date: Course postponed until fall 2017

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

Speakers: Cherif Chibane, Rick Rosson; MIT Lincoln Laboratory

Description:

Over the last 30 years, applications for Field Programmable Gate Array (FPGA) designs have increased exponentially. FPGA's have moved from just digital designs to other areas such as embedded controllers, Digital Signal Processing, communication systems, and configurable computing. This has made exposure to and mastery of FPGA design crucially important for many people in industry and academia.

This course provides a detailed overview of FPGA technologies, a top-down design workflow, modeling and simulation, standard design tools, and applications. Using a mixture of theory and hands-on laboratories, the course provides students what they need to know in modeling, simulation, design, verification, and implementation of multi-disciplinary applications targeting FPGA's. This course provides plenty of hands-on lab exercises to reinforce the key concepts. While the material covered in this class targets Xilinx devices, it can be easily used for others devices such as ALTERA and other FPGA devices.

Presenters:

This course will be jointly presented by Cherif Chibane and Rick Rosson of MIL Lincoln laboratory. Their combined and complementary expertise will greatly benefit attendees from industry and academia.

Cherif Chibane is currently with MIT Lincoln laboratory as a research staff. He was one of the early adopters of FPGA's for configurable computing. Prior to MIT-LL, he was part of the BAE Systems team that pioneered the use FPGA's for Software Denied Radio (SDR). He has more than 25 years in the design of advanced configurable computing using FPGA's for DSP, digital logic, and embedded designs.

Rick Rosson is a senior modeling and simulation engineer at MIT Lincoln Laboratory. Prior to joining MIT-LL, Rick served as a senior applications engineer at MathWorks for 9 years, with a focus on digital signal processing, statistical signal processing, embedded systems design, modeling and simulation, and data analysis and visualization. Rick holds a Master of Science in Electrical Engineering from Boston University and a Master of Science in Management from the MIT Sloan School of Management.

Agenda

Session #1

- Course Overview
- Model based benefits in today's FPGA designs.
- Simulink/Matlab Overview
- Simulink Examples

Session #2
• FPGA Technologies Overview
• Xilinx ISE Overview
• Fixed point Vs floating point overview
• HDL/FPGA Examples

Session #3
• Preparing Simulink models for HDL code generation
• Generating HDL code from Simulink
• Verifying the generated code
• Code Generation Examples

Session #4
• Modeling Signal Processing and Communications Systems in Simulink®
• Signal Processing Examples
• Implementing Signal Processing Systems on FPGA's

Session #5
• Advanced Topics using FPGA's
• End-To-End Design and Verification
• End-To-End Design Example
• Course Summary

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@gamil.com or 781 245 5405.

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

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

Software Development for Medical Device Manufacturers

An intensive Two-day Workshop

Time & Date: 8:30AM - 4:30PM, Wednesday & Thursday, April 5 & 6, 2017

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

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

OVERVIEW:

Developing software in compliance with FDA, EU regulations and international standards is challenging. This two-day intensive course provides practical guidance and suggestions for developing software that complies with applicable FDA and EU regulations, guidance documents and international standards such as IEC 62304 and ISO 14971. The focus of this course is interpreting Design Controls for software. Each section of the Design Controls regulation (820.30) is discussed from the software perspective. Corresponding requirements from IEC 62304 are woven into the flow.

In-depth discussion of critical topics such as Requirements, Software Verification & Validation, Risk Management and Fault Tree Analysis are included. In addition, techniques for validating software development tools and software used in Manufacturing and Quality Systems are also discussed. Interactive group exercises are included to facilitate discussion and learning.

WHO SHOULD ATTEND

Software and firmware engineers, software managers, RA/QA staff, validation engineers, and project managers. Anyone interested in learning how to develop medical device software in compliance with regulations, standards and guidance documents.

COURSE OUTLINE

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

- **Interpreting Design Controls for Software**
  - Software Development Models
  - Design and Development Planning
  - Design Inputs
    - **About Requirements…**
    - **Requirements Exercise**
  - Design Outputs
  - Design Reviews
  - Design Verification
    - Software Verification Techniques
  - Design Validation
    - Software Validation Process
  - Design Transfer
  - Design Changes
  - Design History File

- **Validation of…**
  - Software Tools used to develop Medical Device Software
  - Software used in Manufacturing
  - Software used in Quality Systems

- **Risk Management**
  - Standards and Regulations
  - Terms and Concepts
  - Risk Management Process
  - Risk Management Tools and Techniques
    - **Fault Tree Exercise**
  - Data Collection and Analysis
  - Documentation Requirements

- **Summary**

- **Comprehensive reference materials included**

Speaker Bio:

Steven R. Rakitin has over 40 years experience as a software engineer including 25 years of experience in the medical device industry. He has worked with over 85 medical device manufacturers worldwide, from startups to Fortune 100 corporations. He has written several 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 and a member of MassMEDIC. He is on the Editorial Review Board for the ASQ Journal Software Quality Professional.

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

Decision (Run/Cancel) Date for this Course is Friday, March 24, 2017

Payment received by March 20
IEEE Members $465
Non-members $495

Payment received after March 20
IEEE Members $495
Non-members $545

http://ieeeboston.org/software-development-medical-device-manufacturers-intensive-two-day-workshop/

IEEE
Advancing Technology for Humanity

2017 IEEE Region 1 Annual Student Conference

April 7-9, 2017 – University at Buffalo (SUNY)

Connecting Students with Professionals and IEEE Leaders

Date:
April 7-9, 2017

Location:
University at Buffalo
(SUNY)
208 Davis Hall
Buffalo, NY 14260

Organizing Committee:

Conference Chair:
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(c.rubenstein@ieee.org)

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Version 8: 03/04/2017

The IEEE Region 1 Student Conference is the premier annual event where all student branches from the eight states of IEEE Region 1 (Northeastern US) meet to discuss mutual challenges and compete in regional competitions.

The conference objective is to encourage lively student engagement and provide opportunities for students to network and learn from other students from across Region 1, while applying practical engineering knowledge in the various competitions.

It also provides a great opportunity for student members to network with Industry Professionals and IEEE Leaders.

Conference Highlights:

- *Undergraduate Student Paper Contest*
- *MicroMouse Workshop for Newbies and Pros*
- *Regional MicroMouse Competition*
- *Student Ethics Competition*
- *Award Ceremony and Dinner*
- *Networking Opportunities*
- *Meet IEEE Leaders and Industry Professionals*

To submit a paper for the Undergraduate Student Paper Contest or to register for other Competitions, follow the directions on the conference Hotel and Conference Registration Page at:
https://meetings.vtools.ieee.org/m/44086

Hotel Registration Deadline: March 16, 2017
Conference Registration Deadline: March 31, 2017

About the Hotel Accommodations:
DoubleTree by Hilton Buffalo-Amherst *(10 Flint Road, Amherst, New York 14226) Hotel accommodations will be provided (via a rooming list – do NOT book directly with the hotel) on a first come first serve basis for those traveling more than 100 miles each way. Teams will be required to share a room (4 students per room). Hotel accommodations will not be provided for local participants but meals will be provided during the conference. Those non-students wanting a room should contact Dr. Rubenstein at c.rubenstein@ieee.org to obtain one within our block at $120/night.*

The 2017 Region 1 MicroMouse Competition & Workshop is proudly sponsored by:

IEEE-USA
http://ieeeusa.org

University at Buffalo The State University of New York

SAVE THE DATE! PLAN TO ATTEND!

2017 IEEE International Symposium on Technologies for Homeland Security

25 – 26 April Westin Hotel, Waltham, MA
http://ieee-hst.org/

IEEE Advancing Technology for Humanity

PLENARY SPEAKERS:

Kay C. Goss, CEM, President, World Disaster Management, LLC *Internationally recognized expert, lecturer, author on Emergency Management and General Resiliency*

Dr. Melissa Flag, CEO, Flagg Consulting, LLC. Previously she served as the Deputy Assistant Secretary of Defense for Research in the Office of the Assistant Secretary of Defense, Research and Engineering (OASDR&E) within the Department of Defense (DoD)

The 16th annual IEEE Symposium on Technologies for Homeland Security (HST '17), will be held 25-26 April 2017 **must attend event**, in the Greater Boston, Massachusetts area. This symposium brings together innovators from leading academic, industry, business, Homeland Security Centers of Excellence, and government programs to provide a forum to discuss ideas, concepts, and experimental results.

Produced by IEEE with technical support **from DHS S&T, IEEE, IEEE Boston Section, and IEEE-USA** and organizational support from **MIT Lincoln Laboratory, Raytheon, Battelle, and MITRE**, this year's event will once again showcase selected technical paper and posters highlighting emerging technologies in the areas of

There are over 110 paper and posters to be presented at the symposium with focus on technologies with applications available for implementation within about five years. All areas will cover the following common topics:

- Strategy and threat characterization, CONOPs, risk analysis,
- Modeling, simulation, experimentation, and exercises & training, and
- Testbeds, standards, performance and evaluations.

In addition there will be plenary sessions as well as ample networking activities to interact and exchange ideas with speakers and other symposium attendees.

Contact Information

For more detailed information on sponsorship and Exhibit Opportunities, visit the website http://ieee-hst.org/ or email: information@ieee-hst.org.

The symposium technical program as well as the conference registration and hotel reservation pages are now online (www.ieee-hst.org)

Technical Sessions

Cyber Security Track:
#1: Cyber-Physical Systems
#2: Authentication
#3: Intrusion Detection
#4: Approaches in Cybersecurity Modeling
#5: Secure Systems
#6: Analytics
#7: Testbeds and Training Environments
#8: Privacy
#9: Classification and Scoring Algorithms in Cybersecurity

Attack/Disaster Track:
#1: Critical Infrastructure
#2: Cyber Risk Management and Intelligence Analysis
#3: Resilience
#4: Disaster Preparedness and Response
#5: Network Vulnerability
#6: Situational Awareness
#7: Machine Learning and UAV
#8: Terrorism and Disaster Preparedness

Plus 20 Poster Presentations during our Welcome/networking Reception

Border Security Track:
#1: Airborne Sensing
#2: Enhancing Data Exploitation 1
#3: Enhancing Data Exploitation 2
#4: Ground-based Hardware for Border and Customs Enforcement
#5: Counter-UAS and Small Aircraft Detection
#6: Underwater Imaging
#7: Human- and Cargo-Borne Concealed Threat
#8: Radiological and Nuclear Detection

Biometrics & Forensics Track
#1: Facial Recognition
#2: Finger and Palm Prints
#3: Video Analytics
#4: Ocular Biometrics and Other Modes

QA and Testing in DevOps Automation

Time & Date: 8AM - 5PM, Thursday, April 20 (Please note new date!!!)

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

Speaker: Rajkumar Joghee Bhojan, Wipro Technologies

Introduction: In most of the IT organizations, there are hundreds of applications are getting deployed per release. Currently, Agile projects release cycle duration is reduced dramatically. In this "Fail Fast" environment, choosing right test automation tool and its framework becomes imperative for delivering quality software. This day-long course (lecture/lab) will address the following questions: How to create new ways of adopting QA and testing in their core software? Are we able to deliver better product using existing testing methodologies?

Format: lecture/lab

Topics

- Comprehend the need of automated testing.
- Employ TestNG and Eclipse to execute and write tests.
- Develop a group of test classes with the use of WebDriver.
- Building POM framework
- Running Tests in Parallel
- Understanding how to use Jenkins and GitHub for Selenium Tests
- Design tests to minimize code using inheritance

Target Audience: IT Professionals, Students both UG and PG with Computer Knowledge and Researchers

Benefits of Attending the Course:

- Learning recent technologies in Test Automation space.
- Will get knowledge of Selenium and its techniques in trending technologies

*** Gain Hands-on experience in Selenium WD.**

- Latest technologies used in Software Testing
- Participants can directly implement the taught methodologies in their software projects

Speaker Bio: Rajkumar J.Bhojan is a Test Architect (TA), Wipro Technologies, Quincy, MA, USA. He has over two decades of professional experience in both IT and Academics. He holds M.Sc., (Phy), MCA, and M.Phil (CS). He has executed IT projects in diverse geographies including India, Australia & USA. He has worked as a QA Manager, Scrum Master, Corporate Trainer and Principal Consultant in reputed organizations. He has presented many technical papers at International conferences, Journals, IEEE forums and Google Tech Talks. He is a Certified Scrum Master and has rich experience in Agile/scrum Methodologies. He is a member in IEEE and ACM.
http://sites.ieee.org/sem/files/2013/07/May_2014-WL_Rev1.pdf
http://www.atagg.agiletestingalliance.org/speakers.html. http://princetonacm.acm.org/tcfpro/
He also spoke at Google Tech Talks (GTAC-2016).
https://www.youtube.com/watch?v=RfQi5PNO4L8.

Course Materials, PPT - deck, Working notes and Sample Scripts.

Decision (Run/Cancel) Date for this Course is Wednesday, April 12, 2017

Payment received by April 10
IEEE Members $230
Non-members $255

Payment received after April 10
IEEE Members $255
Non-members $275

http://ieeeboston.org/qa-testing-devops-automation/

Call for Articles

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

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

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

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

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

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

Submissions should be sent to; ieeebostonsection@gmail.com

Advanced Embedded Linux Optimization

Time & Date: **6 - 9PM, Wednesdays, May 10, 17, 24, 31**

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

Speaker: **Mike McCullough, RTETC, LLC**

Course Summary - This 4-day technical training course provides advanced training in the debugging, testing, profiling and performance optimization of Embedded Linux software. The first part of the course focuses on advanced debugging, testing and profiling in an Embedded Linux context with a focus on using Eclipse, Backend Debuggers, JTAG and In-Circuit Emulators as well as Kernel Logging capabilities and Kernel Hacking. The latter part of the course covers performance measurement and optimization affecting boot, memory, I/O and CPU performance and key performance optimization tools for Embedded Linux software including the perf tool, advanced cache usage and compiler-based optimization.

Who Should Attend - The course is designed for real-time engineers who are developing high-performance Linux applications and device drivers using Embedded Linux distributions. It is also targeted at experienced developers requiring a refresher course on Advanced Embedded Linux optimization.

Course Objectives

- To understand debugging, profiling and testing high performance Embedded Linux software.
- To provide an overview of Linux application performance measurement and optimization.
- To understand the tools used for performance optimization of Embedded Linux software.
- To give students the confidence to apply these concepts to their next Embedded Linux project.

Course Schedule Day 1

Getting Started with Embedded Linux
Embedded Linux Training Overview
Terminology
Linux Versioning
The GPL
Building the Kernel Source Code
Embedded Linux Kernels
BSPs and SDKs
Linux References (Books and Online)
A Development Cycle Focused on Performance
A Basic Optimization Process

Basic Debugging Review
Embedded Applications Debug
GDB, GDB Server and the GDB Server Debugger
Other Debuggers
An Eclipse Remote Debug Example
Debugging with printk, syslog, syslogd and LTTng

System-Level Debug
System-Level Debug Tools
The /proc and /sys Filesystems
Basic Logging
KDB and KGDB
Crash Dumps and Post-Mortem Debugging

Debugging Embedded Linux Systems
Backend Debuggers
In-Circuit Emulators
Hardware Simulators
Analyzers

Course Schedule Day 2

Requirements Development
Performance Requirements
Derived Requirements

Testability and Traceability
Reviewing Requirements
Designing for Performance
Design for Test (DFT)
Agile Software Design
Software and Linux Decomposition
Memory Management
CPU and OS Partitioning
Design Reviews
Coding for Performance
Coding Standards and Consistency
Languages, Libraries and Open Source Components
Learning Magic Numbers
Letting Compilers Work For You
Global, Static and Local Variables
Code Reviews

Software Testing
Unit-Level Testing
System-Level Testing
Code Coverage Tools
gcov
Automated Testing
Some Embedded Linux Test Recommendations
DebugFS
Configuring DebugFS
DebugFS Capabilities
Advanced Logging
LogFS
Using Logwatch and Swatch
Using syslogd and syslog-ng
Tracing
ptrace and strace
New Tracing Methods
SystemTap
Ftrace, Tracepoints and Event Tracing
Tracehooks and utrace
Profiling
Basic Profiling
gprof and Oprofile
Performance Counters
LTTng
Another DDD Example
Manual Profiling
Instrumenting Code
Output Profiling
Timestamping

Course Schedule Day 3

Addressing Performance Problems
Types of Performance Problems
Using Performance Tools to Find Areas for Improvement
Application and System Optimization
CPU Usage Optimization
Memory Usage Optimization
Disk I/O and Filesystem Usage Optimization
Measuring Embedded Linux Performance
Some Ideas on Performance Measurement
Common Considerations
Uncommon Considerations
Using JTAG Methods
BootLoader Measurements
Boot Time Measurements
The Perf Tool
Origins of Perf
The Perf Framework
Perf Commands and Using Perf
Listing Events
Counting Events
Profiling with Perf
Static Tracing with Perf
Dynamic Tracing with Perf
Perf Reporting
Performance Tool Assistance
Recording Commands and Performance
System Error Messages and Event Logging
Dynamic Probes
Jprobes and Return Probes
Kernel Probes
Kexec and Kdump
Improving Boot Performance
Boot Time Optimization
The Linux Fastboot Capability
Building a Smaller Linux
Building a Smaller Application
Filesystem Tips and Tricks
Some Notes on Library Usage

Course Schedule Day 4

Improving Kernel Performance
Kernel Hacking
CONFIG_EMBEDDED
Configuring printk
Test Code
Configuring Kernel and IO Scheduling

Improving CPU Performance
Run Queue Statistics
Context Switches and Interrupts
CPU Utilization
Linux Performance Tools for CPU
Process-Specific CPU Performance Tools
Stupid Cache Tricks

Improving System Memory Performance
Memory Performance Statistics
Linux Performance Tools for Memory
Process-Specific Memory Performance Tools
More Stupid Cache Tricks

Improving I/O and Device Driver Performance
Disk, Flash and General File I/O

Improving Overall Performance Using the Compiler
Basic Compiler Optimizations
Architecture-Dependent and Independent Optimization
Code Modification Optimizations
Feedback Based Optimization
Application Resource Optimization
The Hazard of Trust
An Iterative Process for Optimization
Improving Development Efficiency
The Future of Linux Performance Tools

Some Final Recommendations

Lecturer – Mike McCullough is President and CEO of RTETC, LLC. Mike has a BS in Computer Engineering and an MS in Systems Engineering from Boston University. He has held a variety of software engineering positions at LynuxWorks, Embedded Planet, Wind River Systems and Lockheed Sanders. RTETC, LLC provides real-time embedded training and consulting to many embedded systems companies. RTETC focuses on real-time operating systems (RTOS), Linux and Android solutions for the embedded systems market.

Decision (Run/Cancel) Date for this Courses is Monday, May 1, 2017

Payment received by April 28
IEEE Members $395
Non-members $415

Payment received after April 28
IEEE Members $415
Non-members $435

http://ieeeboston.org/embedded-linux-optimization/

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

Embedded Linux BSPs and Device Drivers

Time & Date: 6 - 9PM, Wednesdays, April 12, 19, 26, May 3

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

Speaker: Mike McCullough, RTETC, LLC

Course Summary - This 4-day technical training course provides advanced training in the development of Embedded Linux Board Support Packages (BSPs), Device Drivers and Distributions. The first part of the course focuses on BSP and Software Development Kit (SDK) development in an Embedded Linux context with a focus on application performance measurement and improvement. The latter part of the course covers Embedded Linux Device Driver development including key device driver decisions and deployment considerations for Embedded Linux BSPs.

Who Should Attend - The course is designed for real-time engineers who are developing Embedded Linux BSPs and Device Drivers for Embedded Linux distributions. It is also targeted at experienced developers requiring a refresher course on Linux BSP and Device Driver development.

Course Objectives

• To gain an understanding of the complexities of BSP and SDK development and their uses in Embedded Linux systems.
• To provide a basic understanding of the Linux I/O Subsystem and the Device Driver Models provided with Embedded Linux distributions.
• To gain an in-depth understanding of character-based device drivers in Embedded Linux
• To understand key device driver subsystems including relatively slow I/O interconnects such as I2C, SPI and USB as well as high-speed interfaces such as USB 3.0 and PCIe
• To give students the confidence to apply these concepts to their next Embedded Linux project.

Course Schedule Day 1

Getting Started with Embedded Linux
Linux and the GPL
Building the Kernel Source Code
Embedded Linux Kernels
BSPs and SDKs
Linux References (Books and Online)

Embedded Linux BSP Development Basics
BSP Requirements
U-Boot and Bootloader Development
Basic BSP Development
Files and Filesystem Support
The I/O Subsystem: Talking to Hardware
Memory Management and Paging
Error Handling in Embedded Linux BSPs
Timing and Timers
Interrupt Handling in BSPs
BSP Deployment Issues and Practices

Embedded Linux SDK Basics
The 3 Pieces of an SDK
Embedded Linux Distributions
The GNU Compiler Collection (GCC)
Other Embedded Linux Development Tools
Library Support
Glibc and Alternatives
SDK Deployment and Support

Debugging
GDB, GDB Server and the GDB Server Debugger

Other Debug Tools
An Abatron Board Bring-Up Example
An Eclipse Remote Debug Example
Advanced Debug with printk, syslogd and LTTng
System-Level Debug
System-Level Debug Tools
The /proc Filesystem
Advanced Logging Methods
KGDB and KDB
Crash Dumps

Course Schedule Day 2

Configuring Embedded Linux
Config Methods
Config Syntax
Adding Code to the Linux Kernel
Booting Embedded Linux
The Linux Boot Process
NFS and RAMdisk Booting
Root and Flash File System Development
Building the RAMdisk
Busybox Development
Testing and Debug of Embedded Linux BSPs
Kernel Debug and Kernel Probes
Kexec and Kdump
The Linux Test Project (LTP)
Performance Tuning Embedded Linux BSPs
User Mode Linux and Virtualization
Measuring Embedded Linux BSP Performance
Common Considerations
Uncommon Considerations
BootLoader Optimizations
Boot Time Measurements
Effective Memory and Flash Usage
Filesystem Performance Issues
Some Ideas on Performance Measurement

Course Schedule Day 3

The Original Device Driver Model
The fops struct and Char Drivers
The inode and dentry structs
Major and Minor Numbers
Embedding Channel Information
Deferring Work
The /proc Filesystem
Configuring the Device Driver
Modularization Revisited
The New Device Driver Model
An Object-Oriented Approach
Platform Devices and Drivers
Subsystem Registration
The Probe and Init Functions
The Show and Store Functions
The /sys Filesystem
Configuring the New Device Driver

Comparing the Two Driver Models

The Flattened Device Tree (FDT)
openBoot and its Effect on Embedded Linux
The Device Tree Script (dts) File
The Device Tree Compiler (dtc)
The Device Tree Blob (dtb) File
Building a dtb File
Hybrid Device Drivers
Other fops Functions
The Need for Ioctl
A Simulated Char Device Driver
The SIM Device Driver
Initialization
Open and Close
Read and Write
The /proc Driver Interface
MMAP Support

Course Schedule Day 4

Linux Device Driver Subsystems
Serial Drivers
The RTC Subsystem
Watchdogs
I2C & SPI
Block Devices
PCI
USB
VME
Video
Sound
What's Missing?
Memory Technology Devices

What is an MTD?
NAND vs NOR Flash Interfaces
The Common Flash Interface (CFI)
Driver and User Modules
Flash Filesystems
Drivers in User Space
Accessing I/O Regions
Accessing Memory Regions
User Mode SCSI, USB and I2C
UIO
High-Speed Interconnects
PCIe
GigE
iSCSI
Infiniband
FibreChannel
Serial RapidIO
Debugging Device Drivers
kdb, kgdb and JTAG
Kernel Probes
Kexec and Kdump
Kernel Profiling
User Mode Linux and Kernel Hacking
Performance Tuning Device Drivers
Some Final Recommendations

Lecturer – Mike McCullough is President and CEO of RTETC, LLC. Mike has a BS in Computer Engineering and an MS in Systems Engineering from Boston University. A 20-year electronics veteran, he has held various positions at LynuxWorks, Tilera, Embedded Planet, Wind River Systems, Lockheed Sanders, Stratus Computer and Apollo Computer. RTETC, LLC is a provider of Eclipse-based software development tools, training and consulting services for the embedded systems market.

Decision (Run/Cancel) Date for this Courses is Monday, April 3, 2017

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http://ieeeboston.org/embedded-linux-bsps-device-drivers/

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

Determining and Communicating Project Value Return on Investment (ROI)

ROI Value Modeling ™ for Decision Making

Date & Time: Wednesday, May 24; 8:30AM - 5:00PM

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

Speaker: Robin Goldsmith, President, GoPro Management

Companies are demanding reliable financial measures of proposed projects' value. Yet, project managers often don't know how to identify, calculate, or communicate a project's REAL ROI™ (Return on Investment). Traditional ROI calculations increasingly are being criticized for telling only part of the necessary story. The difficulty afflicts all types of projects but often is greatest in areas like IT, where benefits may seem intangible and frequent overruns impact estimates' credibility. This interactive workshop reveals 22 pitfalls that render common ROI determinations meaningless and shows instead how to identify full-story key effects on revenue and expense variables, reliably quantify tangible and intangible costs and benefits, and convincingly communicate the business value of project investments. Exercises enhance learning by allowing participants to practice applying practical techniques to a real case.

PARTICIPANTS WILL LEARN:

* The financial information that business decision makers need and demand.

* ROI and related calculations, strengths, weaknesses, and common pitfalls.

* Using ROI Value Modeling™ and Problem Pyramid™ to fully identify relevant costs and benefits.

* Quantifying intangibles, risk, flexibility, and opportunity.

* Professionally presenting credible business value measurements so people pay attention.

WHO SHOULD ATTEND: This course has been designed for business, systems, and project managers as well as analysts, implementers, users, and others who must know the return on project investments.

OUTLINE

WHAT MONEY HAS TO DO WITH IT

Project Manager role with regard to ROI
Situations demanding ROI, their issues
Difficulty of making convincing arguments
Linking ROI to the business case
Value Modeling™ Relationship Diagram
Investment vs. expense
Justification vs. objective analysis
Meanings of "It costs too much"
Total Cost of Ownership (TCO)
Factors other than cost to be considered

Costs and benefits, revenues vs. expenses
Return on Investment (ROI) calculations
Net present value, discounted cash flow
Payback period, annualized return
Internal rate of return (IRR), hurdle rate
'Telling the story' not just ROI calculations
Failing to quantify 'intangibles' and risk
Scenario approach to showing benefits
Mistakenly thinking ROI does not apply

DETERMINING MEANINGFUL BENEFITS

Why it's important to find the benefits first
Treacy's model of 5 revenue categories
Problem Pyramid™ to find requirements
Decision variable clarification chain
Putting a dollar value on intangibles
Opportunity, innovation, and flexibility
Mandates, project with no apparent benefits

ESTIMATING CREDIBLE COSTS

Problem Pyramid™ ties costs to value
Basing costs on implementation of design
Business case framework
Basic formula for estimating costs
Main causes of poor estimates
Top-down vs. bottom-up techniques
Risks that afflict ROI calculations
Three measurable ways to address risks
Best-, worst-, most-likely-case scenarios
Sources of parameter sizing assumptions
Defining a reasonable scenario for success
Getting reliable cost and revenue amounts

REPORTING AND MONITORING

Single vs. multiple scenario presentation
Applying apples vs. apples, when you can't
Scenario assumptions and parameters
No change vs. proposed scenarios' ROIs
Measuring intangibles' monetary effects
Continual, step-wise, and one-time changes
Percentage-likelihood impact adjustments
Presenting with spreadsheets
ROI Value Dashboard™ modeling tool
Caution about commercial ROI calculators
Using value modeling to improve decisions
Dashboard and scorecard-type notification
Capturing, calibrating with project actuals
Adjusting appropriately during project

Speaker's Bio: Robin F. Goldsmith, JD is an internationally recognized authority on software development and acquisition methodology and management. He has more than 30 years of experience in requirements definition, quality and testing, development, project management, and process improvement. A frequent featured speaker at leading professional conferences and author of the recent Artech House book, Discovering REAL Business Requirements for Software Project Success, he regularly works with and trains business and systems professionals.

Decision (Run/Cancel) Date for this Courses is Monday, May 15, 2017

Payment received by May 9
IEEE Members $220
Non-members $245

Payment received after May 9
IEEE Members $245
Non-members $265

http://ieeeboston.org/determining-communicating-project-value-return-investment-roi/

Making You a Leader - Fast Track

Date & Time: **Monday, May 22; 8:30AM - 5:00PM**

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

Speaker: **Robin Goldsmith, President, GoPro Management**

We do projects to make change. Yet, change will not occur without leadership, and leaders are rare. Leaders make others want to do what the leader wants done. Leaders cause ordinary people to achieve extraordinary things. Managing is not the same as leading, and titles do not make leaders. Seminars can teach you to manage, but they cannot teach you to be a leader. Rather, making a leader takes special techniques—such as our personal development clinics—that can change deep-seated behaviors learned over a lifetime.

However, since clinics usually last about ten weeks, this mini-clinic was devised as a more convenient alternative. This format places responsibility upon the participant to carry out an extended informal follow-on program after completion of the formal seminar workshop session.

During the follow-on period, the participant uses time-condensed methods that simulate the lifetime learning which makes a leader. Therefore, commitment to carrying out these exercises is essential for successful transformation.

PARTICIPANTS WILL LEARN:

- Leadership characteristics and practices that are essential for project and personal success.
- Differences between management and leadership, how they conflict, and why leaders are so rare.
- Behaviors leaders use to influence others, up and down, to want to do what the leader wants them to do
- Special techniques personal development clinics use to change lifetime learning and make leaders.
- How to employ those special techniques in a follow-on mini-clinic to develop the leadership skills they need to make their projects successful.

WHO SHOULD ATTEND: This course has been designed for business and systems professionals who want to improve their ability to lead and influence other people.

LEADERSHIP CHARACTERISTICS & ROLE
How leadership looks and feels
Management vs. leadership
Leadership components of project success
Basic leadership practices; power sources
Real change leaders in organizations

TEAMS AND LEADERSHIP
Everyone feels leadership is lacking
Everyone thinks s/he is a leader
Results, not actions or intent
Workgroups, teams, and leaders
Situational leadership styles
Coaching and sports analogies to projects

INSPIRING AND MOTIVATING
Gaining commitment to project success
Communicating that influences others
Addressing negativism and groupthink
Conscious and unconscious messages
Greatest management principle

Hierarchy of needs effects on projects
Hygiene factors vs. motivators
Helping project players get their rewards
Influencing up and down without authority
Inspiring the extra efforts projects need
Energizing the project team

SHARED VISIONS
Relating values and vision to projects
Getting others to embrace one's vision
Developing a motivating project vision

WHERE AND HOW LEADERS ARE MADE
Born or made? How do we know?
Habits of thought that affect project success
Overcoming self-limiting lifetime learning
Leader's critical success factors
Traditional education doesn't make leaders
Special way—personal development clinics

SETTING AND ACCOMPLISHING GOALS
S.M.A.R.T. goals for self and project
Action plans to achieve your goals
Visualizing and emotionalizing

DEFINING THE FOLLOW-ON PROGRAM
Clarifying project leadership objectives
Breaking into prioritized subgoals
Establishing rewarding daily achievements
Special techniques to change habits

CARRYING OUT THE MINI-CLINIC
Working with a follow-up support structure
Mapping results regularly to goals
Objectively recording leadership changes
Self-leadership through the process

Speaker's Bio: Robin F. Goldsmith, JD is an internationally recognized authority on software development and acquisition methodology and management. He has more than 30 years of experience in requirements definition, quality and testing, development, project management, and process improvement. A frequent featured speaker at leading professional conferences and author of the recent Artech House book, Discovering REAL Business Requirements for Software Project Success, he regularly works with and trains business and systems professionals.

Decision (Run/Cancel) Date for this Courses is Friday, May 12, 2017

Payment received by May 8
IEEE Members $220
Non-members $245

Payment received after May 8
IEEE Members $245
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http://ieeeboston.org/making-leader-fast-track-2/

Locally held IEEE Conferences

2017 IEEE International Symposium on Technologies for Homeland Security
April 25 - 26, 2017
www.ieee-hst.org
(The technical program, conference registration is now online)

2017 IEEE International Midwest Symposium on Circuits and Systems
August 6 - 9, 2017
www.MWSCAS2017.org
(Call for Papers Deadline, March 10, 2017)

2017 IEEE High Performance Extreme Computing Conference HPEC '17
September 12 - 14, 2017
www.ieee-hpec.org
Submission deadline is May 19, 2017

Proactive user Acceptance Testing ™ -- Confident Competence

The Testing Users need to be Confident the Software they Depend on Works

Date & Time: Thursday, May 25; 8:30AM - 5:00PM

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

Speaker: Robin Goldsmith, President, GoPro Management

Projects aren't complete until users/customers are sure the systems they depend on actually meet business requirements, work properly, and truly help them do their jobs efficiently and effectively. However, users seldom are confident or comfortable testing system acceptability. Project Managers and Testing professionals need to know how to guide and facilitate effective acceptance testing without usurping the user's primary role. This intensive interactive seminar shows what users need to know to confidently make the best use of their time planning and conducting acceptance tests that catch more defects at the traditional tail-end of development, while also contributing in appropriate ways to reducing the number of errors that get through the development process for them to catch in UAT. Exercises give practice using practical methods and techniques.

PARTICIPANTS WILL LEARN:

* Appropriate testing roles for users, developers, and professional testers; and what each shouldn't test.

* How Proactive Testin™ throughout the life cycle reduces the number of errors left to find in UAT.

* Key testing concepts, techniques, and strategies that facilitate adaptation to your situation.

* Systematically expanding acceptance criteria to an acceptance test plan, test designs, and test cases.

* Supplementing with requirements-based tests, use cases, and high-level structural white box tests.* Techniques for obtaining/capturing test data and carrying out acceptance tests.

WHO SHOULD ATTEND: This course has been designed for business managers and system users responsible for conducting user acceptance testing of systems they must depend on, as well as for system and project managers, analysts, developers, quality/testing professionals, and auditors.

ROLE OF USER ACCEPTANCE TESTING

Why users may resist involvement
Making users confident about testing
Objectives, types, and scope of testing
Acceptance testing as user's self-defense
Why technical tests don't catch all the errors
Essential elements of effective testing
CAT-Scan Approach™ to find more errors
Proactive Testing™ Life Cycle model
Separate technical and acceptance test paths
Place of UAT in overall test structure
Making sure important tests are done first
Developer/tester/user test responsibilities

DEFINING ACCEPTANCE CRITERIA

Defining acceptance test strategy up-front
Source and role of acceptance criteria
5 elements criteria should address
Functionality the user must demonstrate
How much, how often user must test
Determining system quality
Who should carry out acceptance tests
How acceptance tests should be performed
Added benefit, revealing requirements errors

DESIGNING ACCEPTANCE TEST PLANS

Expanding the acceptance criteria
Allocating criteria to system design
Refining the design to catch oversights
Checklist of common problems to test
Equivalence classes and boundary values
Making quality factors (attributes) testable
Structural testing applicable to users
GUI features that always need to be tested
Defining requirements-based tests
Constructing use cases
Cautions about use case pitfalls
One- and two-column use case formats
Turning use cases into tests
Consolidating tests into efficient test scripts

CARRYING OUT ACCEPTANCE TESTS

Differentiating test cases and test data
Traps that destroy value of acceptance tests
Warning about conversions
Documentation, training, Help tests
Configuration, installation, localization
Security, backup, recovery tests
Suitability of automating acceptance testing
Performance, stress, load testing
Issues on creating test conditions, data
Capturing results, determining correctness
User's defect tracking and metrics

Speaker's Bio: Robin F. Goldsmith, JD is an internationally recognized authority on software development and acquisition methodology and management. He has more than 30 years of experience in requirements definition, quality and testing, development, project management, and process improvement. A frequent featured speaker at leading professional conferences and author of the recent Artech House book, Discovering REAL Business Requirements for Software Project Success, he regularly works with and trains business and systems professionals.

Decision (Run/Cancel) Date for this Courses is Tuesday, May 16, 2017

Payment received by May 11
IEEE Members $220
Non-members $245

Payment received after May 11
IEEE Members $245
Non-members $265

http://ieeeboston.org/proactive-user-acceptance-testing-confident-competence/

Writing Agile User Story and Acceptance Test Requirements

Date & Time: Tuesday, May 23; 8:30AM - 5:00PM

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

Speaker: Robin Goldsmith, President, GoPro Management

Everyone complains that poor requirements are the major cause of project problems. Yet, like the weather, nobody does much about it, at least not effectively. Traditional approaches advocate writing voluminous requirements documents that too often don't seem to help much and may even contribute to difficulties. Agile goes to the opposite extreme, relying on brief requirements in the form of three-line user stories that fit on the front an index card and a few user story acceptance criteria that fit on the card's back. Surprise, as Mark Twain noted, in some ways it's even harder to write Agile's brief requirements effectively. This interactive workshop reveals reasons user stories and their acceptance tests can fall short of their hype, explains critical concepts needed for effectiveness, and uses a real case to provide participants guided practice writing and evaluating user stories and their acceptance criteria/tests.

PARTICIPANTS WILL LEARN:

* Major sources of poor requirements that cause defects, rework, and cost/time overruns.

* How Agile user stories and their acceptance criteria/tests address these issues.

* Difficulties that still afflict requirements in Agile projects and why they persist.

* Writing more effective user stories and acceptance criteria/tests.

* What else is necessary to produce working software that provides real value.

WHO SHOULD ATTEND:

This course has been designed for product owners, analysts, developers, and other Agile (and other) project team members who are or should be involved in defining requirements.

AGILE, USER STORY FUNDAMENTALS

Agile Manifesto's relevant points
Characterization of traditional approaches
Waterfall and big up-front requirements
Agile's sprints and backlogs alternative
Agile project team roles
User story "As a <role>…" (Card)
User story acceptance criteria (Confirmation)
Estimating user story size
Splitting and refining
Prioritizing and allocating to backlogs/sprint
Constructing/implementing (Conversations)
Reviewing, retrospectives
Grooming backlog and reprioritizing
Exercise: Write Needed User Stories
Exercise: Define their Acceptance Criteria
Exercise: Review Your User Stories/Criteria

REQUIREMENTS ARE REQUIREMENTS—OR MAYBE NOT

User stories are backlog items, features
Chicken and egg relation to use cases
Issues and inconsistencies
Business vs. product/system requirements
"Levels Model" of requirements
Other mistaken presumptions
Requirements overview
Where user stories should fit, do fit instead
Conversation conundrum

WRITING MORE SUITABLE USER STORIES

Problem Pyramid™ tool to get on track
Exercise: Using the Problem Pyramid™
Exercise: Business Requirement User Stories
Issues identifying requirements
Product owner and business analyst roles
Project team participation
Dictating vs. discovering
Data gathering and analysis
Planning an effective interview
Controlling with suitable questions
Then a miracle occurs…

AND USER STORY ACCEPTANCE TESTS

Missed and unclear criteria
Turning criteria into tests, issues
How many tests are really needed
Test design techniques
Checklists and guidelines
Decision trees, decision tables
Boundary testing
Testing is main means to control risk
Defects and new user stories
Testing that user story focus misses
Reactive vs. proactive risk analysis
Given, when, then format

Exercise: Write User Story Acceptance Criteria
Exercise: Design their Tests
Exercise: Review Your User Stories/Tests

Speaker's Bio: Robin F. Goldsmith, JD is an internationally recognized authority on software development and acquisition methodology and management. He has more than 30 years of experience in requirements definition, quality and testing, development, project management, and process improvement. A frequent featured speaker at leading professional conferences and author of the recent Artech House book, Discovering REAL Business Requirements for Software Project Success, he regularly works with and trains business and systems professionals.

Decision (Run/Cancel) Date for this Courses is Friday, May 12, 2017

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