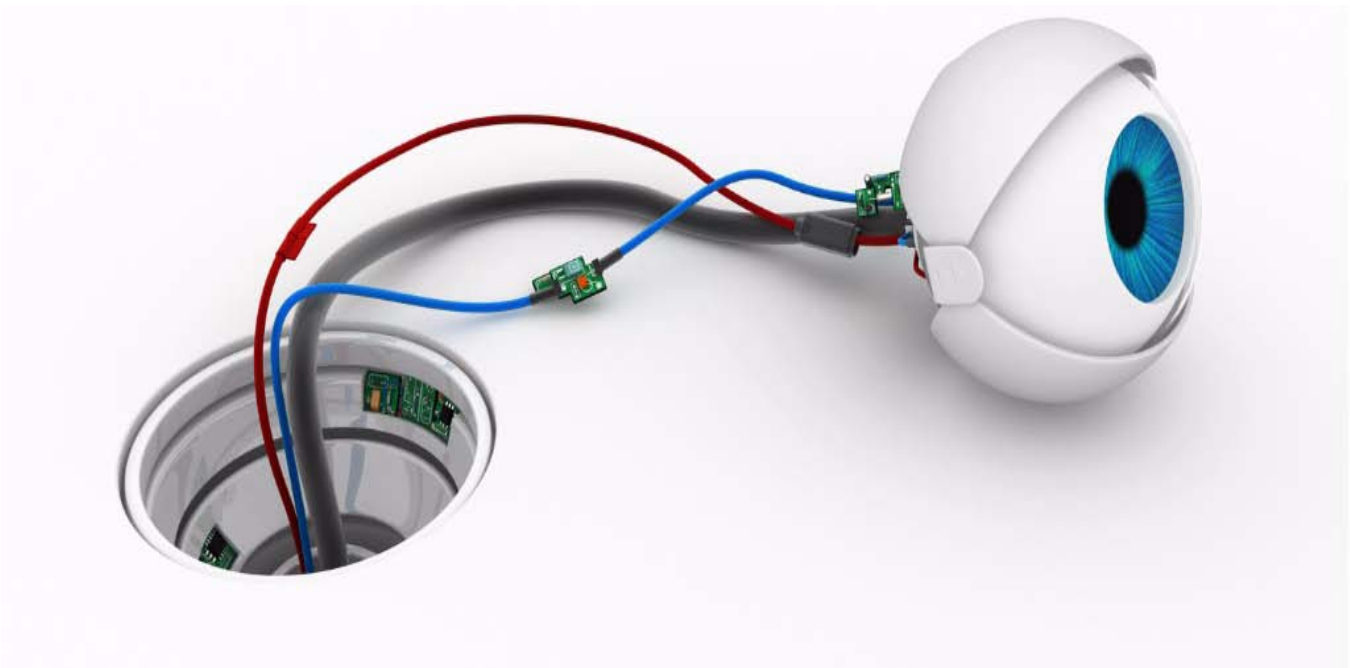
# THE REFLECTOR

ISSUE #7
JULY 2022





Advancing Technology for Humanity

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# Engineering/Tech Education and Training in 2022

by Ramon De la Cruz, Boston Section Past Chair, 2020

As the first half of 2022 has gone by, with most people have returned to the usual end-of-spring activities and eager to go on vacation, we must be mindful of how some things haven't gone back to "normal".

Certain segments of the economy in 2022 haven't fully recovered and this complicates what once was very easy to do, like planning a vacation trip or purchasing large ticket items. The supply chain shortages have reduced choice or forced the consumer to reluctantly "accept" alternate substitutes as their first or second choices are not available or would take too long to be delivered.

However, while most of these effects are being felt on items that depend on commodity markets, one virtually infinite "commodity" remains unaffected: Engineering/Tech Education and Training.

As the Engineering/Tech job market shifts away from the huge demand which started in 2021 to an inflation heading into a recession level in 2022-2023, there is no better time to acquire new skills or become an expert on certain tech field.

The IEEE Boston Section continues its quest to develop and increase its catalog of training courses both in-person and on-line.

Recent collaborations include Electronic Reliability Tutorial Series co-sponsored by ANSYS.

Once again technology has enabled the various leadership and planning committees to continue with their projects with the help of WebEx, Zoom, and other communication tools.

The Boston Section Chapter coordination committee is planning the annual Chapter Leadership meeting with attendance from leaders and volunteers from most of the Boston Chapters and Affinity groups for discussions on Chapter collaboration, events planning and membership development.

Similarly, the Boston Section future events committee will continue with the planning of a series of in-person events in the upcoming months. More information about these events will be announced when the details have been finalized.

A few upcoming events this Fall include:
IEEE High Performance Extreme Computing Virtual Conference (HPEC '22)
IEEE MIT Undergraduate Research Technology Conference (URTC '22)
IEEE International Symposium on Phased Array Systems and Technology (PAST'22)
Virtual IEEE International Symposium on Technologies for Homeland Security (HST '22)
(See Calendar of events for more details)

As industry partners slowly transition through the various stages of reopening their facilities to the public, the Boston Section will continue with the mission of serving the greater Boston area with events, training, and education with the help of technology.

We welcome your comments and suggestions for events, speakers, and courses and hope you have a fun and relaxed summer during the better half of 2022.

# IEEE Boston Section Online Courses:

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

### Electronic Reliability Tutorial Series

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

### High Performance Project Management

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

### Introduction to Embedded Linux Part I

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

### Embedded Linux Optimization - Tools and Techniques

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

### Embedded Linux Board Support Packages and Device Drivers

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

### Software Development for Medical Device Manufacturers

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

### Fundamental Mathematics Concepts Relating to Electromagnetics

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

### Reliability Engineering for the Business World

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

### Design Thinking for Today's Technical Work

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

### Fundamentals of Real-Time Operating Systems

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


# Call for Submissions

To submit: https://cmt3.research.microsoft.com/URTC2022

*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 eight fields of focus are:

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

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| Early Paper Submission Deadline | July 10, 2022 |
| Regular Paper Submission Deadline | July 31, 2022 |
| Regular Notification of Acceptance | August 28, 2022 |
| Poster and Lighting Talk Submission Deadline | August 31, 2022 |
| Poster and Lightning Talk Acceptance Notification | September 7, 2022 |

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 5 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

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

Massachusetts Institute of Technology

https://urtc.mit.edu/

IEEE BOSTON SECTION

## Consumer Technology Society
## Call for Volunteers!

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

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

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

Aakash Deliwala, Chair, IEEE Boston Consumer Technology Chapter

## Engineering in Medicine & Biology Society
## Call for Volunteers!

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

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

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

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

# IEEE Video Series

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

Among the programs they've produced include "Electric Vehicles: Fun Saving Our Planet", "Greener Power For More Electric Vehicles", "Overcoming Nuclear Fears To Achieve Net Zero CO2 By 2050" and "Achieving a Net Zero Carbon Future", "Green Energy's Economic Progress", and "Net-Zero CO2 with Nuclear, Hydrogen and Geothermal". Projects currently in production include the expansive topic of futurology, with a focus on increasing the efficiency and transformation of aging electrical power generating stations and infrastructure to accommodate nuclear power; reviewing the viability of alternative energy (such as geothermal, wind and solar); and focusing on 'cleaner' fossil fuels that are more environmentally-friendly to slow the rate of climate change.

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

The panel is moderated by five-time Boston/New England Emmy Award-winner and television personality and star of "The Folklorist," John Horrigan. These video programs with presentations and discussions can be accessed at the IEEE Boston Section video portal at https://vimeo.com/user18608275.

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

# Call for Course Speakers/Organizers

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

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

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

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

*Entrepreneurs' Network – 6:45PM, Thursday, July 14*

# Sunset Cruise & Networking Evening on Boston Harbor

Location: Rowes Wharf, Boston, MA

After two years hiatus due to the pandemic, ENET and our cruise partners much look forward to renewal of our annual year-end networking tradition with this year's "EntrepreneurSHIP 2022" Sunset Cruise. Our last cruise in July 2019 sold out and with pent-up demand we are seeing, we expect a sell-out might occur again this year. So, please do book early to not get left behind. We are looking forward to another great event cruising the Boston Harbor!

IEEE Boston Entrepreneurs' Network will hold its 18th annual Sunset Cruise & Networking Evening on Boston Harbor aboard the M/V Music City Queen, on Thursday, July 14, 2022. We board the boat at 6:45 p.m., and cruise from 7:15-9:30 pm., with additional networking on the boat dockside until 9:45 pm. The event includes a light dinner catered again this year by the well-respected Off the Vine Catering, who received many compliments for the food the last four years. There will also be a cash bar.

Our ENET Sunset Cruise on Boston Harbor will be an enjoyable, casual wrap-up for the ENET 2021-22 season, our 31st year. We again expect over 150 attendees and guests. To enhance the networking opportunities, we have invited all ENET speakers whose presentations you enjoyed during the past year's webinars along with those who were speakers in 2019-2020 who missed out on the cruise in 2020. We will also be joined by members and guests of several other Massachusetts technology-based entrepreneurial groups, who are partnering with ENET for this "EntrepreneurSHIP 2022" including Women in Bio – Boston, MASS Bio, and Prepare 4 VC.

We will be cruising on the Mass Bay Lines' M/V Music City Queen, an ornamental 19th century sternwheeler named for city on Cumberland River (Nashville): perfect for our year-end gala. Two decks are climate controlled for year-round comfort. The MV/Music City Queen is berthed at Rowes Wharf, behind the Boston Harbor Hotel on Atlantic Avenue in Boston. Parking is available for $10 at International Place garage across the street from Rowes Wharf and there are two "T" stops nearby.

COST:
Early Bird Rates (available until June 30)
$35. per person: ENET Member and member guest
$45. per person: Non-ENET Members
Standard Rates (after June 30)
$45. per person: ENET Member and member guest
$55. per person: Non-ENET Members
Your seat can be saved only by paid-up registration!

PARKING INFO:
Low-cost parking is available after 5:00 pm at 1 International Place garage for just $10.00, just across Atlantic Ave. from Rowes Wharf (Go to https://parking.com/boston/lot/1-international-place/parking-coupon and print coupon to bring with you (you need the coupon for the reduced rate – also please print out this coupon only after July 1 so it will not have expired) and there are two T stops within a ten minute walk (Aquarium and South Station).

SPACE IS LIMITED. So, you are encouraged to REGISTER NOW so you won't miss out.

CANCELLATION POLICY:
Any cancellation on or before June 25, 2022 will receive a full refund of amounts paid for the cruise. Any cancellation after June 25, 2022 up to July 12, 2022, 10:00pm will receive a full credit toward future ENET events or membership.

COVID POLICY:
The Entrepreneurship 2022 will adhere to all requirements of the City of Boston for the health and safety of our passengers and crew. These include any then applicable requirements occasioned by Covid-19 and any new variants. On the chance that a new Covid-19 outbreak makes the cruise inappropriate, in the sole discretion of ENET in consultation with our cruise partners, ENET has the ability to cancel the cruise on short notice to the cruise company and caterer. ENET is grateful to both of those vendors for their flexibility. Should such a cancellation occur, all funds received would be refunded.

ENET 2022 Boston Harbor Sunset Networking Cruise
Once registered, your confirmation email will contain a promo code for you to save $10. either joining ENET as a new member or renewing membership!
Learn how to become a member here,
https://bostonenet.org/membership/

# 2022 IEEE International Symposium on Phased Array Systems and Technology

Revolutionary Developments in Phased Arrays

IEEE BOSTON SECTION

BOSTON 2022

## 11–14 October 2022

**The Westin Waltham Boston**
**Waltham, Massachusetts, USA**

## Conference Registration

**Register by September 1st for Discounted Fees**

see www.array2022.org for details

### About the Symposium

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

Note: *there will be a virtual component of the conference to accommodate potential travel restriction or concerns due to COVID19*

### Plenary Speakers

- Alfonso Farino – Consultant to Leonardo S.p.A.
- Tom Dalrymple – Air Force Research Laboratory Sensors Directorate
- Gabriel Rebeiz – Unversity of California San Diego
- Robert Palmer – Oklahoma University Advanced Radar Research Center
- Israel Lupa – Elta
- Ellen Ferraro – Raytheon

### Special Sessions

- European Phased-Arrays Systems and Technology
- Low Frequency Arrays
- Intelligent Arrays
- SATCOM Arrays
- Weather Arrays
- Wideband 3D-Integrated mmWave Array Tiles

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EPIRUS

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- You will be providing a valuable service to your profession
- Previous lecturers include: Dr. Eli Brookner, Dr. Steven Best, Colin Brench, to name a few.

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

## Web-based Course with live Instructor!

**Times & Dates:** **9AM - 12:30PM ET, Saturday, October 15**

**Speaker:** **CL Kim**

**Course Format: Live Webinar, 3 hours of instruction!**

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

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

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

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

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

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

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

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

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

**Outline:**
Feedforward Neural Networks.
* Simple (Python) Network to classify a handwritten digit
* Learning with Stochastic Gradient Descent
* How the backpropagation algorithm works
* Improving the way neural networks learn:
    ** Cross-entropy cost function
    ** Softmax activation function and log-likelihood cost function
    ** Rectified Linear Unit
    ** Overfitting and Regularization:
        *** L2 regularization
        *** Dropout
        *** Artificially expanding data set

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

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

**Decision (Run/Cancel) Date for this Course is Monday, October 10, 2022**

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

**https://ieeeboston.org/event/neuralnetworks/?instance_id=3285**

# Call for Articles

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

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

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

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

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

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

# Python Applications for Digital Design and Signal Processing

**Dates & Times:** **Live Workshops: 6:00 - 7:30PM EDT; Tuesdays, Sept. 13, 20, 27, Oct. 4**
**First Video Release, September 7, 2022, additional videos released weekly in advance of that week's live session!**

**Speaker:** **Dan Boschen**

**Location:** **Zoom**

*This is a hands-on course combining pre-recorded lectures with live Q&A and workshop sessions in the popular and powerful open-source Python programming language.*
*Course Information will be distributed on Wednesday, September 7, 2022 in advance of and in preparation for the first live workshop session.*
*Attendees will have access to the recorded session and exercises for two months (until December 4) after the last live session ends!*

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

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

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

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

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

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

**Benefits of Attending / Goals of Course:** Attendees will gain an overall appreciation of using Python and quickly get up to speed in best practice use of Python

**Topics / Schedule:**

***Pre-recorded lectures (3 hours each) will be distributed Friday prior to each week's workshop dates. Workshop/ Q&A Sessions are 6 - 7pm on the dates listed below:***

**Class 1**

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

**Class 2**

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

**Class 3**

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

**Class 4**

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

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

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

**Decision (Run/Cancel) Date for this Course is Friday, September 2, 2022**

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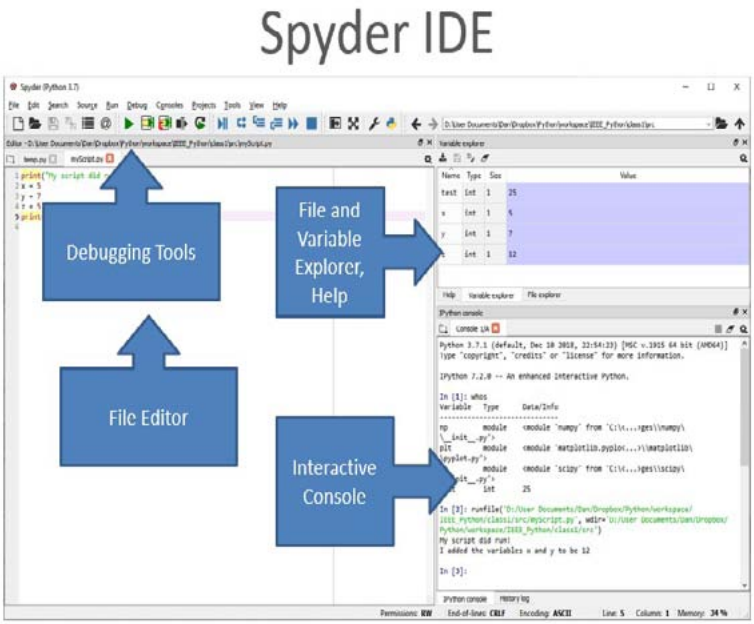
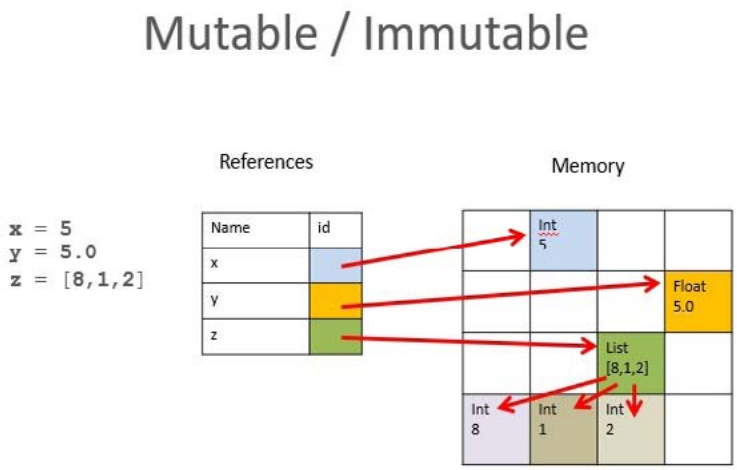
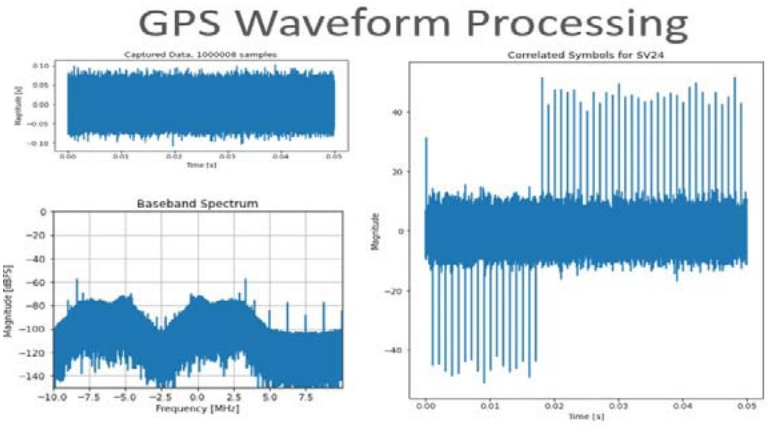
| **IEEE Members** | **$190** |
| **Non-members** | **$210** |




**https://ieeeboston.org/event/pythonapplications/?instance_id=3224**

# Call for Papers (Deadline extended to July 15, 2022)

IEEE Advancing Technology for Humanity

Co-Sponsor: IEEE★USA

## 2022 IEEE Virtual International Symposium on Technologies for Homeland Security

November 14–15, 2022 • information@ieee-hst.org

### Call for Papers

We are pleased to announce that the 21st Annual IEEE Symposium on Technologies for Homeland Security (HST '22), will be held November 14–15, 2022 as a virtual event. This symposium will bring together innovators from leading academia, industry, businesses, Homeland Security Centers of Excellence, and government agencies to provide a forum to discuss ideas, concepts, and experimental results.

HST is produced by IEEE with technical and organizational support from IEEE, IEEE Boston Section, IEEE-USA, MIT Lincoln Laboratory, and Raytheon Technologies. This year's event will once again showcase selected technical papers highlighting emerging technologies in the following areas:

- **Border Security, Critical Infrastructure Protection, and Law Enforcement**
- **Climate Change and Homeland Resilience**
- **Cyber Security**
- **Frontier and Emerging Technologies**

We are currently seeking technical paper submissions in the above areas. This year, the Homeland Security Technology community has come together to respond and develop technology to address the challenges of COVID-19 and we anticipate HST'22 to reflect that focus. Accordingly, all areas are inclusive of technologies related to the global COVID-19 pandemic. Papers examining the feasibility of transition to practice will also be considered. All areas will cover the following common topics:

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

### Contact Information

For more detailed information on the Call for Papers, as well as Sponsorship and Exhibit Opportunities, visit the website: http://ieee-hst.org/ or email: info@ieee-hst.org. Submissions should be sent to the following website: https://cmt3.research.microsoft.com/HST2022/

### Important Dates *(All deadlines are by midnight Eastern Standard Time)*

| | |
|---|---|
| Paper Extended Abstract Deadline: | **July 15, 2022 (extension)** |
| Paper Acceptance Notification: | August 15, 2022 |
| Final Paper Submission Deadline: | October 15, 2022 |

### Organizing Committee

| | |
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| Technical Chairs: | Gerald Larocque, MIT Lincoln Laboratory<br>Anthony Serino, Raytheon |
| Local Arrangement Chair: | Bob Alongi, IEEE Boston |
| Sponsorship/Exhibits Chair: | Bob Alongi, IEEE Boston |
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| *Border Security, Critical Infrastructure Protection, and Law Enforcement* | Bengt Borgstrom, MIT Lincoln Laboratory<br>Rich Moro, Raytheon<br>Arash Samani, Systems & Technology Research |
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**www.ieee-hpec.org**

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*Mr. Robert Alongi*
IEEE Boston Section

***A Note from the HPEC Committee:***
***IEEE HPEC 2022 will be presented as a virtual conference that will allow safe participation and full publication in IEEE Xplore.***

The IEEE High Performance Extreme Computing Conference (HPEC '22) will be held in the Greater Boston Area, Massachusetts, USA on 19 – 23 September 2022. The HPEC charter is to be the premier conference in the world on the confluence of HPC and Embedded Computing.

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

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

| **HPEC accepts two types of submissions:** | **IMPORTANT DATES**: |
|---|---|
| 1. Full papers (up to 6 pages, references not included. Additional pages can be purchased for $200/page).<br>2. Extended abstracts (up to 2 pages, references included). | Submission Deadline: **JUL 09, 2022**<br>Notification of Acceptance: **AUG 15, 2022**<br>Camera Ready Deadline: **AUG 31, 2022** |

Submissions to HPEC '22 should be **https://cmt3.research.microsoft.com/HPEC2022/**

Preference will be given to papers with strong, quantitative results, demonstrating novel approaches or describing high quality prototypes. Authors of full papers can mark their preference for a poster display or an oral presentation. Presenters who wish to have hardware demonstrations are encouraged to mark their preference for a poster display. Accepted extended abstracts will be displayed as posters. Papers can be declared "student paper" if the first author was a student when doing the presented work and will be eligible for the "IEEE HPEC Best Student Paper Award." Papers should not be anonymized. All paper and extended abstract submissions need to use the approved IEEE templates. Full paper submissions with the highest peer review ratings will be published by IEEE in the official HPEC proceedings available on IEEE eXplore. All other accepted submissions and extended abstracts are published on ieee-hpec.org.

Vendors are encouraged to sign up for vendor booths. This will allow vendors to present their HPEC technologies in an interactive atmosphere suitable for product demonstration and promotion. We welcome input (hpec@ieee-hpec.org) on tutorials, invited talks, special sessions, peer reviewed presentations, and vendor demos. Instructions for submitting will be posted on the conference web site shortly.