



Boston Section

Supporting students, working engineers and retirees through professional development, education and resources.

THE *Reflector*

ISSUE #10
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Boston Section

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Boston's "Mechanics Hall" The Electric Landmark

By Gilmore Cooke, IEEE Boston Section

Mechanics Hall was built in 1881 along Huntington Avenue by the Massachusetts Charitable Mechanics Association (MCMA), an ancient and venerable institution with links to Paul Revere. This building was demolished in 1959, but the stone sculpture of Ben Franklin's



bust was salvaged and reinstalled on Milk Street. MCMA, the Massachusetts Charitable Mechanics Association, was established in 1795 to organize and host regular citizens fairs in the city. These historic Mechanics Fairs were at first held every three years, then yearly, after moving into permanent quarters shown in the postcard. MCMA provided the opportunity for craftsmen, inventors and innovators to show off their work. Through much of the 19th century, the association organized conferences and exhibitions devoted to innovation in the mechanical arts. The first Mechanics Fair in New England was held on 18 September 1838 in Faneuil and Quincy Halls. The event was announced at 12 o'clock by the firing of a cannon and the ringing of a large bell placed among the articles for exhibition.

The number of articles of various kinds was estimated at fifteen thousand, including specimens of the most finished workmanship. These events were highly credible and well publicized, encouraging large crowds to see telegraphic instruments, so-called 'philosophical' instruments, teaching models, and all sorts of electric apparatus. In 1839, Daniel Davis received the gold medal for his 'magnetical instruments'. Years later, Bell's 'speaking telephone' received an award. All in all, Mechanics Hall, had a big impact on all sorts of crafts, but especially on electrical technologies. The tradition continued into the 1920s with the popular Annual Radio Shows. In closing, Mechanics Hall was also used for education and fun:



5000 employees of the New England Telephone & Telegraph Company were assembled in 1916 to learn about the new transcontinental long distance telephone service to California. Each seat was hooked-up and connected with a headset receiver to listen to conversations by officials located across the country.

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



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KNOWLEDGE

COMMUNITY

PROFESSIONAL DEVELOPMENT

CAREER ADVANCEMENT

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/>

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/>

NEW

Reliability Tutorial Series: Electronic Failure Mechanisms

https://ieeeboston.org/event/ieee-ansys-reliability-tutorial-series-electronic-reliability/?instance_id=3635

NEW

Reliability Tutorial Series – Accelerated Life Testing for Electronics Reliability

https://ieeeboston.org/event/ieee-ansys-reliability-tutorial-series/?instance_id=3634

ANNOUNCEMENT

2024 IEEE International Symposium on Phased Array Systems and Technology



15 - 18 October 2024

Hynes Convention Center, Boston, Massachusetts, USA

www.ieee-array.org

Platinum Sponsors



Gold Sponsors



Silver Sponsors



Technical Co-Sponsors



Media Sponsor



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 offer a unique opportunity for members of the international community to interact with colleagues in the field of phased array systems and technology.

The committee is thrilled to announce two major changes to the symposium to better reflect the interest and pace of technology development: (1) moving to the larger [Hynes Convention Center](http://www.hynesconventioncenter.com) in the Back-Bay neighborhood of Boston; and (2) increasing the symposium frequency to a two-year cadence. For sponsorship inquiries, please contact sponsorships@ieee-array.org.

Student Sponsorship

The top 10 ranked student papers will receive \$300 to offset attendance costs, sponsored by The TICRA Foundation.

Session Topics

- 5G Arrays
- Array Design
- Array Measurements
- Array Signal Processing
- Automotive Arrays
- Beamforming & Calibration
- Digital Array Architectures
- Dual Polarized Arrays
- Low-Cost Commercial Arrays
- MIMO Arrays
- Medical Applications
- Metamaterial Phased Arrays
- mmWave and Terahertz
- T/R Modules
- SATCOM Arrays

Special Sessions

- European Phased Arrays
 - *Michael Brandfass & Alfonso Farina*
- Commercial Satellite Arrays
 - *Gabriel Rebeiz & Will Moulder*
- Wideband Arrays
 - *Justin Kasemodel & John Volakis*
- Low Frequency Arrays
 - *Cecelia Franzini & Eric Robinson*
- Weather Arrays
 - *Caleb Fulton & Matt Harger*
- EurAAP Lens-Array Combination
 - *Stefania Monni & Oscar Quevedo*
- 3D Printing Techniques for Phased Arrays
 - *Esteban Menargues & Maria Garcia-Vigueras*

Committee

Symposium Chairs

Sean Duffy (C), MIT LL
Wajih Elsallal (VC), MITRE

Technical Program Chairs

David Mooradd (C), MIT LL
Glenn Hopkins (VC), GTRI

Special Sessions Chairs

Matt Facchine, NGC
Kenneth E. Kolodziej, MIT LL

Plenary Session Chair

Will Moulder, MIT LL
William Weedon, Applied Radar

Student Paper Competition

Matilda Livadaru, Raytheon
Justin Kasemodel, Raytheon

Tutorials

Cara Kataria, MIT LL
Frank Vliet, TNO

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Mark McClure, STR

Digital Platforms Chairs

Pierre Dufilee, Raytheon
Jacob Houck, GTRI
Mark Fosberry, MITRE
Shireen Warnock, MIT LL

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Philip Zurek, MIT LL
Jack Logan, NRL
Elizabeth Kowalski, CFS

Poster Sessions Chair

Honglei Chen, MathWorks

Advisors

Daniel Culkin, NGC
Alan J. Fenn, MIT LL
Jeffrey S. Herd, MIT LL
Bradley Perry, MIT LL

Arrangements/ Administration

Robert Alongi, IEEE Boston
Kathleen Ballos, Ballos Assoc.

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 Articles

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

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

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

would be best.

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

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

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

Submissions should be sent to;
ieeebostonsection@gmail.com

IEEE Boston Section Volunteers Wanted!

Are you passionate about technology and eager to contribute to the advancement of your field? The IEEE Boston Section is excited to announce a call for volunteers to join our dynamic team of professionals and enthusiasts. By becoming a volunteer, you'll have the opportunity to collaborate with like-minded individuals, develop new skills, and make a meaningful impact on the local technology community.

About IEEE Boston Section:

The IEEE Boston Section is a thriving community of engineers, researchers, students, and industry professionals dedicated to promoting technological innovation and knowledge sharing. Our section hosts a variety of events, workshops, seminars, and conferences throughout the year, providing members with opportunities to learn, network, and stay updated on the latest developments in their fields.

Volunteer Opportunities:

We are currently seeking volunteers to help on the following committees:

The Fellow and Awards Committee - activities include recommending qualified members of the Section for advancement to Fellow grade and for receipt of the various IEEE (IEEE/Region/MGA/Section) awards. Identifying and building a database of the various IEEE awards available for nomination and searching out qualified candidates, for preparing the necessary written recommendations, and for assembling all required supporting documentation and submit its recommendations directly to the appropriate IEEE body.

Time Commitment: Meets 4 times a year for 1 – 2 hours per meeting (virtual or in person)

Local Conferences Committee - activities include identifying timely topical areas for conference development. Identify champions of these conferences to run the identified conference organizing committees. The section local conference committee is not charged with organizing and executing individual conferences.

Time Commitment: Meets 4 times per year 1 – 2 hours per meeting (virtual or in person)

Professional Development & Education Committee - activities include identifying topics, speakers, and/or organizers for appropriate technical lecture series or seminars. The subject matter should be timely, of interest to a large segment of the membership, and well organized with regard to speakers and written subject matter.

Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

The Membership Development Committee - activities include actively promoting membership in the IEEE and shall encourage members to advance to the highest grade of membership for which they are qualified. To these ends this committee shall include wide representation within the Section territory, shall maintain lists of

prospects and members qualified for advancement, and shall provide information and assistance to preparing applications.

Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

Student Activities Committee - activities include attracting a broad and diverse group of undergraduate and graduate students to IEEE and to engage them in activities that promote their own professional development as well as the ongoing growth of IEEE. The Student Activities Committee shall include among its members the IEEE Counselors at the universities, colleges, and technical institutes that lie within the Section territory. It shall be responsible for liaison with the Student Branches at these institutions and advise the Executive Committee on all other matters affecting the Student Members of the Section.

Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

Young Professionals Affinity Group - activities include organizing programs, and initiatives aimed to address the needs of early-career professionals pursuing technology-related careers in engineering, business, management, marketing, and law. This committee is committed to helping young professionals evaluate their career goals, polish their professional image, and create the building blocks of a lifelong and diverse professional network.

Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

Benefits of Volunteering:

Volunteering with IEEE Boston Section offers numerous benefits, including:

- Networking opportunities with professionals in your field.
- Skill development and enhancement through hands-on experience.
- Contribution to the local technology community and its growth.
- Access to cutting-edge information and discussions.

How to Get Involved:

If you're enthusiastic about technology and want to make a difference, we invite you to join us as a volunteer. To express your interest and learn more about specific roles, please visit our website and fill out the volunteer application form. Our team will get in touch with you to discuss opportunities that align with your interests and skills.

Thank you for considering this opportunity to contribute to the IEEE Boston Section. Your dedication and passion are what drive the success of our community and its impact on the world of technology.

Volunteer Here!

<https://ieeeboston.org/volunteer/>



IEEE SiPS 2024

IEEE Workshop on Signal Processing Systems

4–6 November 2024

Cambridge, Massachusetts, U.S.A.

The 37th IEEE Workshop on Signal Processing Systems (SiPS) is a premier international forum in the area of design and implementation of signal processing systems. It addresses all aspects of architecture and design methods of these systems. Emphasis is on current and future challenges in research and development in both academia and industry.

Program Highlights

Software Implementation of Signal Processing Systems

Hardware Implementation of Signal Processing Systems

Design Methods of Signal Processing Systems

Machine Learning for Signal Processing

Signal Processing Application Systems

Special Sessions

- Quantum techniques in signal processing and machine learning
- Signal processing in communications, navigation and sensing for autonomous systems
- Technologies for next-generation edge AI platforms

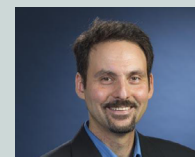
Keynote Speakers



Song Han, MIT



William Oliver, MIT



Alexander Wyglinski, WPI

Important Deadlines

Student and Young Professional Funding Application	Sep 30, 2024
Advanced Registration	Oct 7, 2024

Committee

General Chairs

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Joe Cavallero, Rice

Program Chairs

Jari Nurmi, Tamere Univ.
Jani Boutellier, Univ. of Vaasa

Finance Chair

Warren Gross, McGill University

Local Organizing Chair

Brian Telfer,
MIT Lincoln Laboratory

Entrepreneurs' Network – 7:00PM, Tuesday, October 1

Harnessing Deep Technology for Profit and Purpose

Panel, Q&A and Networking

This is a hybrid event. You may choose to participate in-person or online.

Location: Alumni Ventures Group, 7 Post Office Square (Boston's Financial District) Boston, MA

Refreshments: Pizza and soft drinks will be served.

Registration: <https://bostonenet.org/upcoming-startup-events/>

There are many motivations for entrepreneurs, but many set out to achieve a “double bottom line” result of both financial and social return on investment. Many founders seek to solve some of society's biggest challenges. That is true for the leaders of three companies: The Routing Company, RevivBio, and Axoft. These early-stage venture capital-backed companies were each born in the scientific research labs of Harvard and MIT.

The Routing Company is an on-demand vehicle management system that is creating the future transit system. RevivBio uses AI and bioengineering for sustainable health and wellbeing. Axoft is working on brain implants to treat neurodegenerative disease. Paul Le Floch, co-founder and CEO of Axoft will be joined by The Routing Company's co-founder and CTO Alex Wallar, as well as Aileen Mastouri, co-founder and

CEO of RevivBio.

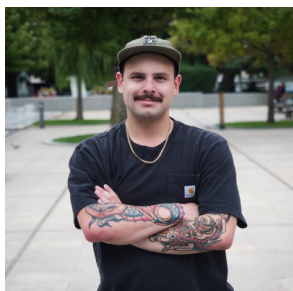
They will share what they've learned:

- To move from academic to commercialization through tech transfer.
- To raise funding and what's worked and what hasn't.
- To incorporate AI into their platform.
- To identify milestones and meet them.

This informative and compelling discussion will be led by Ron Levin, managing partner at Alumni Ventures and author of the book, “Higher Purpose Venture Capital.” Alumni Ventures, named the most active VC firm in the US by Pitchbook for the past two years, invests early in companies alongside other well-established VC firms.

Panel

Paul Le Floch - Co-founder/CEO, Axoft
 Alex Wallar - Co-founder/CTO, The Routing Company
 Fatemeh “Aileen” Mastouri - Co-founder/CEO, RevivBio
 Ron Levin - Managing Partner at Alumni Ventures and Author of “Higher Purpose Venture Capital”
 Moderator and Organizer: Howard Sholkin - VP, ENET



Alex Wallar



Fatemah “Aileen” Mastouri



Howard Sholkin



Paul LeFloch



Ron Levin

In-person Participation (check-in begins at 6:00 PM):

Program:

On-Site Check-in and Networking

7:00 pm ET – Introduction - ENET Chairperson's announcements

7:10 pm ET - eMinute Pitch - up to 3 startups give a 90-second elevator pitch

7:25 pm ET - Expert Panel - expert speakers on the night's topic

8:15 pm ET - Q & A - Moderator and Audience Q & A with the speakers

8:30 pm ET – Networking - Final Networking, including the night's speakers

Howard Sholkin has several decades of marketing communication experience across industry sectors. Since 2018, he has served as President of Newton Community Pride, a non-profit supporting a few dozen events in the city where he is a lifelong resident. In 2014, he formed Sholkin Consulting to deliver digital marketing services to technology and financial services companies. He also served on the adjunct faculty of Boston University and Lasell College for five years.

In 2003, he was hired as director of corporate communications at International Data Group (IDG) where he served Founder Pat McGovern. Sholkin later became director of communication and marketing programs for the CEO of IDG Communications, a global technology media and events subsidiary. IDG brands include Computerworld, PCWorld, Macworld, and CIO.

Sholkin has held senior marketing and communication positions at technology product and services companies such as Computervision; Technology Concepts, a subsidiary of Bell Atlantic; Corporate Software; and, Digital Equipment Corp./Compaq. He was a columnist for PR News and for Personal Branding magazine, one of the first publications on social media.

Since 1990, Sholkin has been active in the Public Relations Society of America (PRSA) where he once served as president of the Boston chapter. Currently, he is co-chair of the national PRSA Investment Committee. He serves on the boards of three non-profits: Newton Community Pride, Boston Entrepreneurs Network (ENET) and Temple Shalom of Newton.

Online Participation: Zoom links will be sent to all registrants after registration.

Cost and Reservations: This event is free for ENET members and \$20 for non-members. Click [here to learn how to become a member](#). To expedite sign-in for the event, we ask that everyone — members as well as non-members — pre-register. If you cannot pre-register, you are welcome to register in person at the door while seats are available.

Please!

- Double-check your email address so you receive the confirmation email with the zoom link.
- Do not forget to let us know if you are attending in person or online.
- Let us know how you heard about this meeting!

Thank you!!



IEEE Boston/Providence/New Hampshire Reliability Chapter – 5:30PM, Wednesday, October 9

ESD Device Level Testing Standards Review and Die-to-Die and Direct Pin Injection Testing Impacts

Speaker: Tom Meuse

This is a hybrid event. You may choose to participate in-person or online.

Location:

Lincoln Laboratory, 244 Wood Street, Lexington, MA.
Building: Cafeteria

As device technologies evolve and continue to shrink, manufacturing methods are also being stressed, which can impact yields due to ESD performance. ESD test standards are continuing to evolve as well to meet these changes. However as complex devices such as 3D packing with 1000s of Die to Die interconnects become more widely used, this is challenging the “standard” way ESD testing is performed.

Another point of interest for system level testing, is call for a Direct Pin Injection test method. Although the most widely used system level testing standard, IEC 61000-4-2 standard recommends not performing testing on pins of a connector, many manufacturers are being forced to perform this test. We’ll discuss the Industry Councils on ESD Target Levels approaches to this testing requirement.



Tom Meuse

Tom Meuse is an Applications/Product/Technology Engineer for the Compliance Test Solutions division of Thermo Fisher Scientific, which is located in Tewksbury MA, USA. He is responsible for the Thermo Scientific ESD and Latch-up test system operations and future product research. Tom is a member of the ESD Association Device Testing (WG-5.x) committee, chair of the ESDA’s WG14 System Level working group and a member of the JEDEC JC-14.1 Committee on Reliability Test Methods. He’s also a member of the Joint ESDA/JEDEC Device Testing

work group and a contributing member to the Industry Council on ESD Target Levels. In addition, he’s also a Board of Directors member on both the National and the Northeast Chapter of the ESD Association.

During Tom’s 40 plus year career, which began with KeyTek Instruments, he worked on Surge and ESD simulator designs, in both an engineering capacity and as the project manager on both system level and device level testers. He’s provided numerous technical seminars focusing on ESD/Latch-up testing and Standards Evolution and has authored and co-authored numerous papers on topics relating to ESD device level testing and ESD system design.

5:30 PM Pizza, salad, soda, and Networking
6:00 PM Technical Presentation
6:45 PM Questions and Answers
7:00 PM Adjournment

The meeting is open to all. You do not need to belong to the IEEE to attend this event; however, we welcome your consideration of IEEE membership as a career enhancing technical affiliation.

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

Registration:

[HTTPS://EVENTS.VTOOLS.IEEE.ORG/M/427623](https://events.vtools.ieee.org/m/427623)



Power and Energy Society – 6:00PM, Tuesday, October 22

Challenges along the Journey toward 100% Renewables: A Grid Operation's Perspective

Speaker: Xinghao Fang, Sales Manager of Operations Technical Studies, ISO New England



This is an in-person event.

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

Location:

Wentworth Institute of Technology, Building: Beatty Hall (Room: Beatty 436), 550 Huntington Ave, Boston, MA 02115 (Free parking at West Parking Lot)

The power grid has been evolving rapidly in the last decade and such a trend will likely continue in next ones in our nation, primarily driven by the revolutionary energy source transition from predominant fossil-fueled synchronous generators toward inverter-based renewables (IBRs, including wind, photovoltaic, and battery). In this context, a significant amount of renewable interconnections have been requested



Xinghao Fang

in the New England territory: IBRs make up roughly 9,800 megawatts (MW) in today's system; by the end of this decade, it is expected to have about 11,000 MW of solar power alone.

In addition, other IBR interconnection requests include nearly 16,000 MW of wind, 11,000 MW of battery storage, and 1,200 MW high-voltage direct current (HVDC) from Canadian hydropower. Due to the nature of intermittent resource and unique physical structure and control schemes from conventional

synchronous machines, the high penetration of IBRs has been playing a significant role in altering the long-standing behavior of the power system and as such introduced unprecedented grid reliability challenges, including but not limited to, load forecast, power balancing during fast resource ramping, inertia support, voltage control, short-circuit strength, control stability and etc.

This talk will walk through context of those pressing challenges and ISO's on-going efforts (as part of the whole industry's agenda) on addressing them effectively.

Xinghao Fang is currently the Manager of Operations Technical Studies at ISO New England. Since he graduated from Rensselaer Polytechnic Institute with the Ph.D. degree in Electric Power Engineering, he has been working in electric power industry for 16+ years, encompassing the fields of transmission planning and operations. His experience and business interests focus on power system modeling, primary frequency regulation, large-scale power system simulation, power system stability and control with high penetration of inverter-based resources. He also taught Power System Analysis and Micro-grid courses at UConn from 2020 to 2022.

Free and Open to the Public; RSVP is appreciated.

[Visit our web page to RSVP](#) and for further details.

For any questions regarding this presentation or any IEEE PES Boston Technical Meetings, please contact: PES Boston Technical Meetings Chair: Chris Sweeny (christopher.sweeny@1898andco.com)

Parking Directions: Address: 550 Huntington Ave, Boston, MA 02115

Introduction to Neural Networks and Deep Learning (Part I)

Web-based Course with live Instructor!

Times & Dates: 8:30AM - 12:30PM ET, Saturday, October 26, 2024

Speaker: CL Kim

Course Format: Live Webinar, 4 hours of instruction!

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

Reference book: “Neural Networks and Deep Learning” by Michael Nielsen, <http://neuralnetworksanddeeplearning.com/>

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: 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
Friday, October 18, 2024**

Payment	on/by Oct. 1	After Oct. 1
IEEE Members	\$95	\$110
Non-members	\$115	\$130

https://ieeeboston.org/event/neuralnetworks/?instance_id=3598

Call for Course Speakers/Organizers

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

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

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

If you have an expertise that you feel might be of

interest to our members, please submit that to our online course proposal form on the section's website (www.ieeeboston.org) and click on the course proposal link (direct course proposal form link is

<http://ieeeboston.org/course-proposals/>. Alternatively, you may contact the IEEE Boston Section office at ieeebostonsection@gmail.com or 781 245 5405.

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

DSP for Wireless Communications

Dates & Times: Live Workshops: 6:00 - 7:30 PM ET, Thursdays, Oct. 17, 24, 31 & Nov. 7 & 14, 2024
First Video Release, October 10, 2024, (Orientation) 6:00 - 6:30 PM
Additional videos released weekly in advance of that week's live session

Speaker: Dan Boschen

Location: Zoom Webinar

New Format Combining Live Workshops with Pre-recorded Video - This is a hands-on course providing pre-recorded lectures that students can watch **on their own schedule** and an **unlimited number of times** prior to live Q&A/Workshop sessions with the instructor. Ten 1.5 hour videos released 2 per week while the course is in session will be available for up to two months after the conclusion of the course...until January 14, 2025.

Course Summary

This course is a fresh view of the fundamental and practical concepts of digital signal processing applicable to the design of mixed signal design with A/D conversion, digital filters, operations with the FFT, and multi-rate signal processing. This course will build an intuitive understanding of the underlying mathematics through the use of graphics, visual demonstrations, and applications in GPS and mixed signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges in both the analog and digital domains, and not a tutorial on working with specific DSP processor hardware.

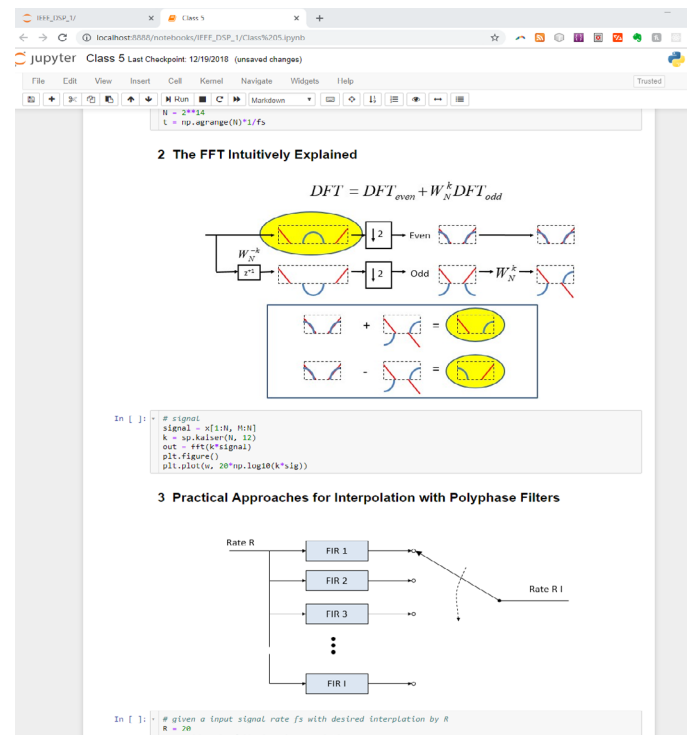
Now with Jupyter Notebooks!

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

This course will not be teaching Python, but using it for demonstration. A more detailed course on Python itself

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

Students will be encouraged but not required to load all the Python tools needed, and all set-up information for installation will be provided prior to the start of class.



Target Audience:

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

Benefits of Attending/ Goals of Course:

Attendees will build a stronger intuitive understanding of the fundamental signal processing concepts involved with digital filtering and mixed signal analog and digital design. With this, attendees will be able to implement more creative and efficient signal processing architectures in both the analog and digital domains. The knowledge gained from this course will have immediate practical value for any work in the signal processing field.

Topics / Schedule:

Class 1: Correlation, Fourier Transform, Laplace Transform

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

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

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

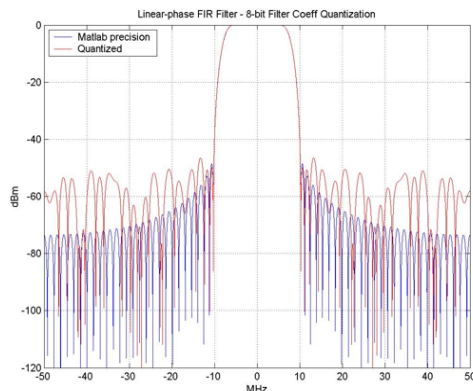
Class 5: Fast Fourier Transform, Multi-rate Signal Processing, Multi-rate Filters

Speaker's Bio:

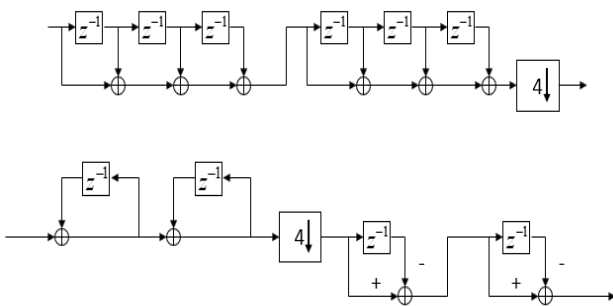
Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing and developing transceiver hardware from baseband to antenna for wireless communications systems. Dan is currently at Microchip (formerly Microsemi and Symmetricom) leading design efforts for advanced frequency and time solutions.

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

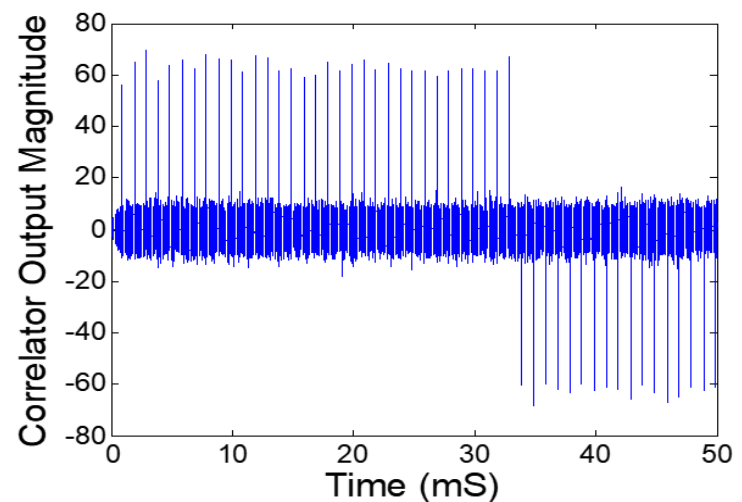
Linear Phase FIR Filter
(8-bit quantized filter coefficients)



Multi-stage CIC



Sliding Correlation



**Decision (Run/Cancel) Date for this Course is
Friday, October 4, 2024**

Payment	on/by Oct. 1	After Oct. 1
IEEE Members	\$190	\$285
Non-members	\$210	\$315

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