Wavelengths

Volume 62 – Issue 08

Contents

Upcoming Events

We have several events coming up this month, all are listed below, FYI.

Event	Date	Time
Software Engineering Challenges for AI/ML-based Systems	02 Aug 2022	06:00 PM
Introduction and demonstration of a restaurant robot	10 Aug 2022	06:30 PM
Ch8: AdCom Teleconference	11 Aug 2022	11:00 AM
SEM Section ExCom Monthly Meeting (virtual) for August 2022	04 Aug 2022	06:30 PM
Technical Meeting: AMD microprocessors roadmap an in-depth presentation	16 Aug 2022	06:00 PM
EMC Society Monthly tech Meeting	18 Aug 2022	05:30 PM
Automotive History Blending the Past with the Present	24 Aug 2022	06:00 PM
DC Arc Flash Calculations	26 Aug 2022	09:00 AM
Hedy Lamarr: documentary	26 Aug 2022	06:00 PM

Note: All times are EST/EDT. If any events are missed do kindly bring them to the attention of wavelengths@ieee-sem.org. Thank you!

Chair's Column

Welcome to the August 2022 edition of the Wavelengths.

In July we held our first Section ExCom in-person in over a year. 15 individuals gathered at the Engineering Society of Detroit headquarters. It was great to catch up with colleagues and to work on volunteer activities for the Section. We are always looking for additional volunteers and now is a great time to step forward if you have been sitting on the fence.
Also in July we held two PACE events – to boost the professional skills of our members – *"Root Cause Analysis"* and *"Agile Methods"*. The idea is to give a competitive edge to our members to help them advance their careers. Look for more such similar PACE events to be held again (Usually on Saturdays, 3 hours in duration).

There are several great virtual events scheduled within our Section in the upcoming months. This includes the virtual events from several of our chapters and affinity groups online. Several Southeastern Michigan Section volunteers have been diligently working to ensure a great content and satisfying participation. We also have several great yearly events coming up. This includes the Embedded Systems Workshop 2022 slated for this fall. This will be 20th year of that event, so kudos to all the organizers.

A heads up for October - We will be holding a senior elevation event. The focus will be on individuals who apply for and are eligible to be promoted to Senior member status. Senior Member is a titled that must be applied for by an individual once that have achieved 10 years of experience, with credit for advanced degrees (2 years for a Masters or 5 years for a PhD), and can demonstrate significant contributions to our industry. I encourage every member who meets those qualifications, to apply. The application requires 3 existing Senior Members to provide a reference. Feel free to reach out if you need assistance in finding references.

Volunteering:
IEEE volunteers learn leadership and team building skills that are not usually part of the engineering curriculum. Speaking of volunteering, the nominations website is open now for volunteers to serve at the Section, Chapter and Affinity Group levels. These are elected positions and the procedure is discussed on page 7. So please consider volunteering.

Nominations and Elections:
Speaking of volunteering, the nominations website will open in September for volunteers to serve at the Section, Chapter and Affinity Group levels. These are elected positions and the procedure is discussed on page 7.

Student Elevation to Full Membership in August
All students graduating before the end of 2022 will be automatically elevated to Professional Member status sometime around mid-August. We encourage all newly elevated members to renew and receive **50% off their first year**! An eNotice will follow up on this. In the mean time here is the code (FUTURE50) you can use to get the 50% discount.

Section's Conference is Coming!
Some good news. After a lapse of nearly 3+ years, the Section's conference has been rejuvenated and will take place in either late Spring or Fall of 2023. Please give your input and full support to Keyur Patel, who is our new conference chair. He has a write up elsewhere in this edition of Wavelengths.

I would be remiss if I did not thank our existing and spectacular team of volunteers that we have in this organization. I look forward to seeing everyone soon!

Sharan Kalwani
Via email: chair@ieee-sem.org
Section members are encouraged to engage using <u>any</u> of these online platforms:

Technical Activities Report

2022 IEEE SE Michigan Section Geo-unit Status (Till July 29th)

Ch's & AG's	Ave Tech Mtg. Attend	Ave Tech Mtg Guest	#L31 -Technical	#L31 -Admin	#L31 Professional	#L31 -Other	Geo-Unit Name	# Unreported	Total Mtgs
CnsIt	11	3	1	0	1	0	Consultants Network	0	2
LIFE	0	0	0	0	2	0	Life Members	0	2
WIE	14	1	2	7	0	1	Women In Engineering	0	10
YP	0	0	0	0	0	0	Young Professionals	0	0
1	78	0	1	0	0	0	Circuits & Systems, Signal Proc., Info Th.	0	1
2	45	0	2	1	0	0	Vehicular Technology	0	3
3	0	0	0	0	0	0	Aerospace & Elec. Sys., Communications	0	0
4	0	0	0	0	0	0	Trident (Ant, Elect Dev., uWave, Photo)	0	0
5	29	6	25	3	2	1	Computers	0	31
6	0	0	0	0	0	0	Geoscience & Remote Sensing	0	0
7	20	1	1	4	0	0	Power Engineering, Industrial App.	0	5
8	59	41	7	7	0	1	Electromagnetic Compatibility (EMC)	1	15
9	24	4	3	1	0	0	Power Electronics, Industrial Electronics	0	4
10	6	2	2	0	0	0	Engineering Management	0	2
11	55	37	1	2	0	0	Eng. in Medicine & Biology	0	3
12	0	0	0	0	0	0	Control Systems	0	0
13	15	3	11	1	0	1	Education	0	13
14	0	0	0	0	0	0	Robotics & Automation	0	0
15	42	27	4	0	0	0	Nuclear Plasma Science Society	1	4
16	78	0	1	0	0	0	Computational Intelligence / Sys.Man.Cyber.	0	1
17	0	0	0	0	0	0	Nano Technology Council	0	0
SEM	39	5	4	14	2	0	SEM (Section)	1	20
	513	129	65	40	7	4	NOTE: Highlight Green = Active	3	116
		25%					NOTE: Highlight clear = Concern		

Per the accompanying report there are several chapters and affinity groups that are showing no activity. Chapter 15 Nuclear Plasma, please review vTools to confirm your currently unreported meeting via a L31 report. There is still a need to plan and conduct meetings before the end of this calendar year. GA leaders please reach out to the TAcom for any assistance. GA members if you have suggestions or requests for technical meetings please contact me via the email below. There is still a need to plan and conduct meetings before the end of this calendar year. GA leaders please reach out to the TAcom for any assistance. GA members if you have suggestions or requests for technical meetings please contact me via the email below.

V/r
Jeffery V. Mosley, Chair, Technical Activities Committee, R4 IEEE SE Michigan, jvmosley@ieee.org

ESW2022 is Coming!

20th Annual Embedded Systems Workshop

October 22 (Virtual only) and 29th (in-person only), 2022, 8:30 a.m. to 12:30 p.m. (Two Saturdays) EST/EDT Time Zone. Each day has different speakers.

IEEE Computer Society and IEEE Education Society (Southeastern Michigan Chapters) are offering a TWO half-day set of workshops on Embedded Systems on Saturday, October 22nd and 29th, 2022. This workshop is open to all industry professionals, both experienced and newly minted engineers, as well as students. This is the 20th year that the event is being held. The theme for this year is: "*Role of AI in Automotive Embedded Systems*".

The aim is to disseminate knowledge, directly benefitting the IEEE members, at the same time **improve the technology skills pool, indirectly boosting the economy**. Speakers and experts from the embedded systems industry will be making presentations and will also be available for discussions and networking during the event. In addition to the technical presentations, there will be industry interaction and potential recruitment sessions. Use this opportunity for virtual networking with engineers, industry experts and embedded enthusiasts.

Please confirm your participation by registering on the IEEE events web site

Deadline is 16th October, 2022 11 pm

Virtual using Video Conferencing (Oct 22)

In person event (Oct 29)

Speakers in the past: Beningo Embedded Group, Infineon, TeKnowledge, Intrepid CS and others…

Attendees: There is a small one-time cost of $5 (IEEE members and students) to attend, this will help cover door prizes, video recording, storage, presentations, a dedicated website and other logistics. Several random raffles representing the embedded systems industry will also take place. All are welcome. Do post this flyer in your workplaces, share/inform your peers & colleagues about this event. It is a great way to learn not only what is going on, but also network (virtually) with other professionals as well.

Brought to you by the IEEE SE Michigan Computer & Education Society chapters. Do seriously consider joining the IEEE, boost your technical skills, broaden your awareness of compute-based engineering in the region, support numerous similar initiatives & learn other benefits this brings.

Open to all, Pre-registration is necessary for attending! **The deadline to register is 16th October 11 PM, 2022**

For Technical questions, contact the Program Committee **at:** esw2022@ieee-sem.org

A CEU/PDH Certificate will be made available for participants who Pre-register and attend both days!

ESW 2022 Organizing Committee: Subra Ganesan (Chair), Sharan Kalwani (Vice Chair), Ramesh S, Carla Gerst, Nilesh Dudhaia, Praveena Jakkula, Sreenivas Eeshwaroju and Ben Sweet

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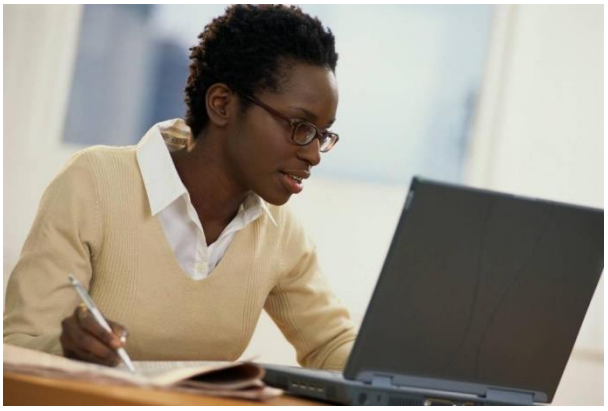


ESD's review course classes begin next week, so register today!
Let us help you prepare for the next stage in your career.
ESD has helped thousands of engineers prepare for their exam in a variety of disciplines.
You'll learn in a small-group online setting from instructors teaching only their specialty.

For more information or to register, click on the links above, **visit esd.org**, or
contact **Elana Shelef at eshelef@esd.org or 248-353-0735, ext. 119**.

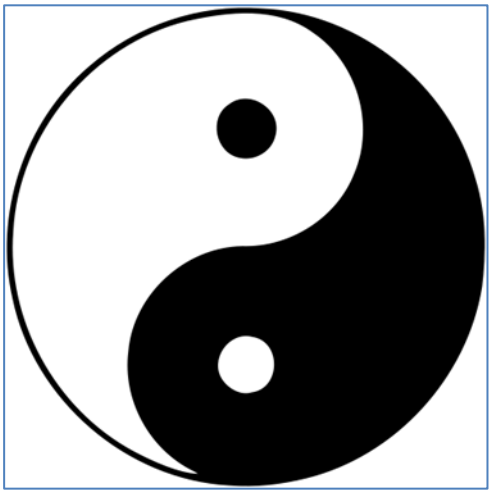
Online via Zoom Platform

Are you thinking of pursuing your PE license?
The professional engineer (PE) license is one of the most important credentials an engineer can obtain.
A symbol that is recognized as an assurance of technical competence and a commitment to quality and ethics.
Plan to attend an information session and learn what you'll need to get started on your path to licensure.

Cost: Introductory sessions - Complimentary to the engineering community.

To Register: Click here to register online **https://www.esd.org/programs/pe-info/** .
Once registered you can hop into ESD's Zoom Room on any of the dates listed.
Or, by appointment with Elana Shelef. E-mail eshelef@esd.org to schedule a personalized session.

IEEE & Ethics



Before we had electronic forms for joining or renewing our membership in the IEEE there used to be a 'check box' to indicate that you had read, and agreed to follow, the IEEE Code of Ethics:

The form is not totally electronic, and now the 'check box' is only a click away. Good? Perhaps not.

An increasing number of authors for IEEE Symposia, Workshops, Journals, and other publications are being cited as violating the code of ethics when copying the work of others, or even themselves, and claiming that the work and the writing is 'original' when it manifestly is not. This has resulted in an ever-increasing number of members being barred from future publication in IEEE for several years.

For working engineers in academia, industry or government, that can be embarrassing and can be a cause for loss of employment, certainly loss of trust. For our colleagues in academia the restrictions on publication opportunities can be career limiting and is potentially disastrous.

In a lecture on "Ethical Challenges in the Engineering Professions" Elya Joffe, (Past President, IEEE EMC Society) points out that engineering ethics is not new: From pre-Christian Rome we get Cicero's Creed: "Salus populi suprema est lex," "The safety of the public shall be their highest law"(*Marcus Tullius Cicero, 106 - 43 BC*)
In Rome recall that the engineers were responsible for buildings, clean water, waste removal, roads, and bridges.
An early statement of the engineer's responsibility

The implication is clear.

Some ethical questions facing engineers are unique to engineering while others are common to other professionals
i.e. Specialized knowledge inherent in the various branches of engineering.

- Engineering has a direct and vital effect on the quality of life of people
- The public cannot judge the quality of engineer work independently of practitioners
- Services provided by engineers must be dedicated to protection of the public safety, health and welfare
- Thus, engineers must perform under a standard of professional behavior requiring the highest principles of ethical conduct

Example: Challenger Disaster: O-ring Sealing problems

- Engineers argued against launch at low temperature
- Management over-ruled the engineer's warnings
- Shuttle exploded minutes into the flight

7 Lives lost were lost with severe loss of trust for NASA resulting in major setbacks to the shuttle program.

"There is a difference between engineers and managers Engineers should adhere to their professional norms and hold safety paramount and managers do not always do this."

Within IEEE the Society on the Social Implications of Technology has often been the organization pushing for clear ethical statements and ethical behavior as well as the defender of some engineers who 'stood by their guns' and held to their ethics in the face of personal, financial political and public pressure to 'bend the rules'.

If you want to learn more about the Society on the Social Implications of Technology (SSIT), visit their website at:
https://technologyandsociety.org/

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Nominations

By the time you read this, all SEM members who have not 'opted out' of receiving messages from their local IEEE should have received the links to the survey form used to nominate candidates for Section Officer positions.
(Executive Committee / Chapters / Affinity Groups – in short, their "**Geo-unit**")

Note: Student Branches and HKN Chapters arrange their own elections at times that seem appropriate for their circumstances.

Careful selection of candidates becomes the first step in electing competent leaders who will fulfil the duties of their office while learning all the ins and outs associated with any elected or appointed position. If good candidates are not nominated for election, there is almost no chance of their being elected! Simple logic tells us that.

If your local Chapter or Affinity Group that represents the IEEE Society that aligns with your chosen professional path is doing a great job of finding good speakers and arranging for informative presentations, tutorials, or classes, why not nominate them for re-election?

If your local Geo-unit officers have been doing nothing during the past year, why allow them to stay in office? It has been said: "The only thing required for evil to succeed is for good people to do nothing." The same can be said of poor or ineffective leadership.

Look at the SEM Technical Activities report on in this issue and if you see few or no meetings recorded for your Geo-unit, download a copy of the SEM organization roster
(**https://r4.ieee.org/sem/wp-content/uploads/sites/6/2022/06/Organization_Roster_6.23.2022_Rev0.pdf**)
and see the name officers in charge who have been doing nothing. Consider a change.

Self Nomination:
For any member with grade of Graduate Student or above, one of the best opportunities for learning those 'Soft Skills' that eventually make or break an engineering career is to volunteer for election, or appointment to a position on a Geo-unit.
If you are lucky enough to join a Geo-unit or committee with competent officers they will encourage you to train in the many skills you will need, and point you to the available 'on-line' training in soft skills at the IEEE Center for Leadership Excellence. **https://ieee-elearning.org/CLE/**

The training is good and helpful. However, your 'homework' is the actual work you will do as a functioning part of the organization on a day-to-day basis. This is where you discover the subtle differences between your understanding of the formal 'lessons' and actual practice of the skills. Just like playing sport or a musical instrument. You have to practice in order to have any real facility with the skill.

Nominate a friend:
If you know someone who you believe may become an effective officer, talk to them, and find out if they would be willing to help run the organization. If so, get their **name**, **email, phone number and IEEE member number** and **member grade** to use to fill out a complete ballot survey and put them on the ballot for a particular office.
(*Sometimes we can work with just a name but the process becomes much more difficult*.)

Use the link below to use the survey **between now and August 31, 2022**.

- Nominate at: **https://4eyes.io/s/a60uH/**

We Need to Talk

If you want to freak out the people you work with, tell them, “We need to talk.” If you really want to freak them out, say those four magic words late on a Friday, or even better, the day before someone goes on vacation. “We need to talk” is rarely followed by, “and you’re awesome.” People know bad news is likely coming, and they’ll inevitably be on edge.

The antidote to asking for time to talk is to create opportunities to give feedback regularly.

There are many reasons giving feedback is hard. One of them is we wait too long. Something happens. We know we should address it, but we don’t want to. So, we wait to see if the behavior is really ‘a thing.’ Then it happens again. And now we know it’s ‘a thing.’ But we still don’t want to address it. Then the situation gets really bad, and now we have to say something. The conversation then takes 90 minutes, is painful, and everyone goes home unhappy.

Here are two keys to make giving feedback easier:

Giving feedback strategy one: Debrief everything. Do a quick plus/delta on a regular basis to assess how things are going. Plus – what went well? Delta – what would we change if we could/what did we learn?

I recommend doing a quick debrief at the end of important meetings, hiring processes, projects, and when anything changes. Conduct a short debrief when you have staffing changes, gain or lose a client, launch or eliminate a product or service, etc. Change is an opportunity to evaluate how you work and to make appropriate adjustments.

When you debrief important events, you tell people that feedback is important and that it’s ok to be candid. Conducting regular debriefs also gives employees a chance to practice giving feedback, which is a hard skill. And like anything, the more we give feedback, the easier it becomes.

Conducting short, regular debriefs is one of the easiest ways to learn from the past and become a more candid culture.

Giving feedback strategy two: Schedule five to fifteen minutes each week to talk as a team or with direct reports. When you know you have time each week to talk with your manager, direct reports, and/or team members, you never have to ask for time to talk. Issues don’t build up or linger. Breakdowns and frustrations are discussed within of few days of their occurrence, and no one is on edge that bad news is coming at their end of their vacation.

The key to being effective at giving feedback is to give feedback regularly. Short, frequent feedback conversations are much more effective than infrequent, long conversations that everyone dreads and leaves feeling exhausted and demoralized.

Debrief everything meaningful. Meet with people weekly. Ask for and give feedback as things happen and watch your culture change.

About Shari Harley
Shari Harley is the founder and President of Candid Culture, a Denver-based training firm that is bringing candor back to the workplace, making it easier to give feedback at work. Shari is the author of the business communication book *How to Say Anything to Anyone: A Guide to Building Business Relationships that Really Work*. She is a keynote speaker at conferences and does training throughout the U.S. Learn more about Shari Harley and Candid Culture’s training programs at www.candidculture.com.

Space Weather

By Tereza Pultarova

In late 2021, operators of the European Space Agency's (ESA) Swarm constellation noticed something worrying: The satellites, which measure the magnetic field around Earth, started sinking toward the atmosphere at an unusually fast rate — up to 10 times faster than before. The change coincided with the onset of the new solar cycle, and experts think it might be the beginning of some difficult years for spacecraft orbiting our planet.

"In the last five, six years, the satellites were sinking about two and a half kilometers [1.5 miles] a year," Anja Stromme, ESA's Swarm mission manager, told Space.com. "But since December last year, they have been virtually diving. The sink rate between December and April has been 20 kilometers [12 miles] per year."

Satellites orbiting close to Earth always face the drag of the residual atmosphere, which gradually slows the spacecraft and eventually makes them fall back to the planet. (They usually don't survive this so-called re-entry and burn up in the atmosphere.) This atmospheric drag forces the International Space Station's controllers to perform regular "reboost" maneuvers to maintain the station's orbit of 250 miles (400 km) above Earth. This drag also helps clean up the near-Earth environment from space junk. Scientists know that the intensity of this drag depends on solar activity — the amount of solar wind spewed by the sun, which varies depending on the 11-year solar cycle. The last cycle, which officially ended in December 2019, was rather sleepy, with a below-average number of monthly sunspots and a prolonged minimum of barely any activity. But since last fall, the star has been waking up, spewing more and more solar wind and generating sunspots, solar flares and coronal mass ejections at a growing rate. And the Earth's upper atmosphere has felt the effects.

"There is a lot of complex physics that we still don't fully understand going on in the upper layers of the atmosphere where it interacts with the solar wind," Stromme said. "We know that this interaction causes an upwelling of the atmosphere. That means that the denser air shifts upwards to higher altitudes."

Denser air means higher drag for the satellites. Even though this density is still incredibly low 250 miles above Earth, the increase caused by the upwelling atmosphere is enough to virtually send some of the low-orbiting satellites plummeting. "It's almost like running with the wind against you," Stromme said. "It's harder, it's drag — so it slows the satellites down, and when they slow down, they sink."

Knocked down by a solar storm

The Swarm constellation, launched in 2013, consists of three satellites, two of which orbit Earth at an altitude of 270 miles (430 km), about 20 miles (30 km) above the International Space Station. The third Swarm satellite circles the planet somewhat higher — about 320 miles (515 km) above ground. The two lower-orbiting spacecraft were hit more by the sun's acting out than the higher satellite was, Stromme said.

The situation with the lower two got so precarious that by May, operators had to start raising the satellites' altitude using onboard propulsion to save them.

ESA's Swarm satellites are not the only spacecraft struggling with worsening space weather. In February, SpaceX lost 40 brand-new Starlink satellites that were hit by a solar storm just after launch.

The sun unleashed a major X1.1 class solar flare from an active sunspot cluster on its eastern limb on April 17, 2022. (Image credit: NASA/SDO and the AIA, EVE, and HMI science teams). In such storms, satellites suddenly drop to lower altitudes. The lower the orbit of the satellites when the solar storm hits, the higher the risk of the spacecraft not being able to recover, leaving operators helplessly watching as the craft fall to their demise in the atmosphere.

Starlink satellites have operational orbits of 340 miles (550 km), which is above the most at risk region. However, after launch, Falcon 9 rockets deposit the satellite batches very low, only about 217 miles (350 km) above Earth. SpaceX then raises the satellites' orbits using onboard propulsion units. The company says that approach has advantages, as any satellite that experiences technical problems after launch would quickly fall back to Earth and not turn into pesky space debris. However, the increasing and unpredictable behavior of the sun makes those satellites vulnerable to mishaps.

New space and the unpredictable sun

All spacecraft around the 250-mile altitude are bound to have problems, Stromme said. That includes the International Space Station, which will have to perform more frequent reboost maneuvers to keep afloat, but also the hundreds of cubesats and small satellites that have populated low Earth orbit in the past decade. Those satellites — a product of the new space movement spearheaded by private entrepreneurs pioneering simple, cheap technologies — are particularly vulnerable. "Many of these [new satellites] don't have propulsion systems," Stromme said. "They don't have ways to get up. That basically means that they will have a shorter lifetime in orbit. They will reenter sooner than they would during the solar minimum." By coincidence (or beginner's luck), the onset of the new space revolution came during that sleepy solar cycle. These new operators are now facing their first solar maximum. But not only that. The sun's activity in the past year turned out to be much more intense than solar weather forecasters predicted, with more sunspots, more coronal mass ejections and more solar wind hitting our planet.

"The solar activity is a lot higher than the official forecast suggested," Hugh Lewis, a professor of engineering and physical sciences at the University of Southampton in the U.K. who studies the behavior of satellites in low Earth orbit, told Space.com. "In fact, the current activity is already quite close to the peak level that was forecasted for this solar cycle, and we are still two to three years away from the solar maximum."

Stromme confirmed those observations. "The solar cycle 25 that we are entering now is currently increasing very steeply," she said. "We do not know if this means that it will be a very tough solar cycle. It could slow down, and it could become a very weak solar cycle. But right now, it's increasing fast."

Cleaning up orbits

While the harsh solar activity is bad news for satellite operators, who will see the lifetimes of their missions shortened (even satellites with onboard propulsion will run out of fuel much faster because of the need for frequent altitude boosts), the situation will have some welcome purifying effects on the space around Earth.

In addition to becoming populated with hundreds of new satellites over the past decade, this region of space is cluttered with a worrying amount of space debris (old satellites, spent rocket stages and collision fragments). Researchers like Lewis have long warned that the omnipresent junk hurtling around the planet threatens the safety of satellite services, forcing operators to conduct frequent avoidance maneuvers. Moreover, the debris might trigger an out-of-control situation known as Kessler syndrome, an unstoppable cascade of collisions as depicted in the 201 Oscar-winning movie "Gravity." "Generally speaking, increasing solar activity — and its effect on the upper atmosphere — is good news from a space debris perspective, as it reduces orbital lifetimes of the debris and provides a useful 'cleaning service,'" Lewis said.

According to Jonathan McDowell, a space debris expert at the Harvard-Smithsonian Center for Astrophysics, the positive effect can already be observed, as fragments produced by the November 2021 Russian anti-satellite missile test are now coming down much faster than before. However, there is a downside to this cleansing process.

"The increased rate of decay of debris objects can be perceived almost like rain," Lewis said. "When solar activity is high, the 'rain' rate is higher, and missions at lower altitudes will potentially experience a greater flux of debris." A greater flux of debris means the need for even more frequent fuel-burning avoidance maneuvers and a temporarily increased risk of collisions, which could potentially generate more dangerous fragments.

Stromme and her colleagues are currently raising the orbit of the two low-orbiting Swarm satellites by 28 miles (45 km). The satellites might require even more adjustments later this year, she added. The goal is to help the mission, which is currently in its ninth year and beyond its originally planned lifetime, to get through the solar cycle. Whether the team succeeds will largely depend on the behavior of the sun.

"We still have fuel to get us hopefully through another solar cycle," Stromme said. "If it grows like now, I will use up the fuel before the solar cycle is finished. If it slows down a little, I might save them through the solar cycle."

Why Morse?

I belong to several Amateur Radio organizations, some local, some national or international. However one in unique in its goals and objectives and how it goes about achieving those.
The organization is the **Long Island CW Club**. **https://longislandcwclub.org/**

I should say that this 'club' is more of an educational organization than a fraternal one. Each week it conducts 75 'Classes' most of which are dedicated to teaching Morse code to a wide variety of individuals. It is my perception that the majority of members are already Amateur Radio Operators who became 'Hams' by passing the FCC 'Technician' license which requires no Morse code profeciency. After a year or two they realize how limited they are in their ability to commuicate, especially long distance, and they begin trying to teach themselves 'the code'.

Other LICW members are new Hams, just getting started, and older hams who knew the code years ago and need to brush up their stills.

Since its origins about three years ago the club has grown to where it now has 3030 members in 50 states and 47 countries and teaches 75 classes, workshops and forums each week. It also provides children's classes free of charge for children K-12. Adults pay a nominal membership fee.

Learning Morse code is an auditory process, and teaching methods that use charts of dots and dashes simply add an extra mental step in the learning process. Hear the sound, recall the chart and the specic sequence, recall the letter associated with the chart entry, find the letter.

Some time ago it was perceiveded that since Morse code is a strictly 'audio' language, with no 'written' literature, it is best taught in the same way one would learn a new verbal language by 'deep immersion' into a culture where that language is the only thing you hear. For Morse code, you learn by hearing the code letter, and immediately saying or hearing its English equalivent. No extra steps between hearing and recoganizing the content.

Years ago one of the geniuses of Amateur Radio, **Nancy Kott, WZ8C** (now what 'Hams' call a 'Silent Key) wrote an article that described her journey to Morse code: "Go With the Flow" can still be found on the web at:
https://w4aaz.org/wp-content/uploads/2019/06/GoWithTheFlow.pdf
She followed it with "Instant Recognition":
https://cwops.org/wp-content/uploads/2019/04/Instant-Recognition-and-Go-With-the-Flow-Nancy-Kott.pdf
Both have become staples of those of us who 'pound brass' as CW operators. If you have any interest in the topic, I recommend spending a few enjoyable hours with Nancy's writings.

The Long Island CW Club has adopted Nancy's ideas, (along with Farnsworth and Koch) to develop a series of group classes taught on ZOOM that being a new 'Ham' (or anyone interested in learning) to full capability of using and efficiently communication with Morse code. Since its origins about three years ago the club has grown to where it now has 3030 members in 50 states and 47 countries and teaches 75 classes, workshops, and forums each week. It also provides children's classes free of charge for children K-12. Adults pay a nominal membership fee.

This topic is at the front of my mind because I am giving a presentation to the IEEE Electromagnetic Compatibility Society at its yearly Symposium in Spokane, Washington. The presentation is "What's keeping Morse Code alive?" and it presents the question: 'Considered a technology Dinosaur with several apparent 'replacement' communication technologies in existence, why is Morse code still used in so widely?' The answer is, as you would expect, complex and involved, and yet at the same time simple. When everything else fails, it still works! 73

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CREAI'22 Report

Conference on Recent Trends in Embedded Artificial Intelligence (CREAI'22), June 9-10, 2022

IEEE Southeastern Michigan Computer Society Technical Chapter (aka Chapter 5) has been organizing full day Embedded System workshops for the past 19 years. More than 100 persons typically attend. Since we started streaming online, we have had attendees from other US states and overseas countries as well. Our Chapter 5 has received many awards in recognition for this work. For 2021, the parent IEEE Computer Society gave us two awards: ***"Chapter of the Year"*** and ***"Industry Engagement"***. At this point in 2022, or just 25 weeks, we have organized 25 technical meetings! (more than any other local chapter globally). If you are a member of IEEE SEM, you would have received announcements for these events via the well-known E-notice mechanism. Do feel free to participate in Chapter 5 events for all the educational insights, and networking. This year we organized the 1st Embedded conference dealing with AI (Augmented/Assisted Intelligence) or CREAI (Conference on Recent Advances in Embedded AI). Our plan is to make this an annual in-person event.

There has been an explosion of research activities in AI and its applications. Such activities require inter-disciplinary collaborations and contributions from scientists, engineers, researchers, academicians, and entrepreneurs. For example, AI has applications in general purpose embedded systems, automotive, medical, IoT (Internet of Things) and many others. CREAI'22 provided an excellent international forum for sharing knowledge and results in theory, methodology and applications of AI in embedded systems. For this first CREAI conference, we had presentations from ten expert international speakers, each presentation duration was nearly an hour. Here is a summary of the technical presentations. The conference started with a warm welcome speech by Professor Subra Ganesan, Chair of the CREAI'22 and current Chair of Chapter 5. The co-ordination of the technical talks was done by Mr. Sharan Kalwani, Chair of IEEE Southeastern Michigan Section.

The first presentation was on "Introduction to Embedded AI" by Professor Ganesan of Oakland University. This presentation was aimed to clarify the role of AI, what is AI, basic concepts of AI, a few software and hardware tools, etc.
The second presentation was by Mr. Jacob Beningo, from the Beningo Embedded Group. He is an expert in real time embedded systems, is very much involved in real time system projects for various industries. He also has been offering embedded systems courses for the past ten years. He gave a presentation on "Choosing the right RTOS for Embedded AI Systems". He explained how to select the best RTOS for an application. The third presentation was by Dr N Rakesh, Professor from India. He is an expert in data science and software. He presented basic concepts and advanced status with application of data science. He presented this emerging field, their applications, and the advanced software tools. He described data science life cycle, and applications.

After a two-hour break for lunch and for catching up office work, the afternoon session had two presentations. The fourth presentation in sequence was by Dr. Unnikrishnan, co-founder of EneuroLearn, an AI/ML startup company currently in stealth mode, on "How can neuroscience help AI". He mentioned that the next generation of Deep Learning (DL) systems with "Neuroscience Inside" are needed in real-time vision systems, for example in future autonomous vehicles, etc. Mammalian visual system actively modify the inputs to achieve robust perception. One can learn and adopt computational principles from Mother Nature.

The last speaker of day 1 of the conference was Dr. George Pappas from Lawrence Technological University (LTU). He presented a talk on the use of AI in Manufacturing Industry. The talk was well received by the audience, as we all live and work in a region, that is heavily manufacturing oriented. He described applications in predictive maintenance, production planning, material movement, etc. That brought the first day to a close.

The second day presentations started with a talk by Professor Dr. Suresh Sundaram from the Indian Institute of Science (IISc) from Bangalore, India. His presentation was on AI driven autonomous vehicles (AV). He described how AV is a very good application for AI.

The next presentation was a joint session by two experts from MathWorks. They presented how to integrate AI-based virtual sensors into model-based designs. This generated a lot of interest from the audience, who are automotive engineers, working in control systems.

The third presentation of the day was by our high-performance computing expert, Mr. Sharan Kalwani. He presented a talk on "Thoughts on ML in Edge Computing". He explained the basic concepts of Edge Computing. He described also TinyML, different types of embedded AI computing and a couple of sample projects.

After the lunch break, we had two more presentations showing AI applications in the medical field. The fourth presentation of the day was a research type paper by Ilovan and Dr George Pappas, from LTU on "Improve prediction accuracy and classification of bone using ML with Hounsfield Units (HU)". He described the use of HU for modeling and performing bone classification, predict osteoporosis etc.

The last presentation of the day was by Dr. Manimurugan from the University of Tabuk, Saudi Arabia on "AI in Healthcare". The presentation described classification of AI, benefits of AI and showed the limitless applications of AI in healthcare, and other clinical applications. The conference came to an end with closing remarks by the organizers, inviting audience to send in their comments on this conference.

The conference video presentations have been posted at the following links.

Day 1 (June 9, 2022)

1) Welcome to CREAI'22 (6 minutes): https://vimeo.com/718916528
2) Introduction to Embedded AI (Subra Ganesan, 47 minutes): https://vimeo.com/718916855
3) Best Practices for RTOS applications (Jacob Beningo, 31 minutes): https://vimeo.com/718925130
4) Introduction to Data Science (Rakesh, 51 minutes): https://vimeo.com/723038089
5) How can Neuroscience help AI? (KP Unnikrishnan, 43 minutes): https://vimeo.com/721151922
6) AI in Manufacturing Industry (George Pappas, 45 minutes): https://vimeo.com/721152915

Day 2 (June 10, 2022)

1) Welcome to 2nd day of CREAI'22 (7 minutes): https://vimeo.com/719361768
2) AI-driven Autonomous Vehicle (S. Suresh, 34 minutes): https://vimeo.com/722942041
3) Integrating AI-based virtual sensors (MathWorks, 46 minutes):
    a. Introductions: https://vimeo.com/723769096
    b. Main presentation: https://vimeo.com/723769562
    c. Q&A, discussion: https://vimeo.com/723774383
4) Thoughts on Edge Computing (Sharan Kalwani, 48 minutes): https://vimeo.com/723012140
5) Improve Accuracy Prediction ML using HU (Paul Ilovan, 36 minutes): https://vimeo.com/723015730
6) AI in Healthcare (Manimurugan S, 50 minutes): https://vimeo.com/722865016

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Member News

Southeastern Michigan's EMCFest 2022 was a wonderful event! Everyone was so happy to be together again in person! They had scheduled a picnic in Auburn Hills on July 21st, 2022 to be catered by Alfoccino. Alas, COVID reared its ugly head, as two of the vaxed and boosted members scheduled to attend contracted COVID, and many scheduled to attend had also been exposed. The picnic sadly had to be cancelled! Cathy, the EMC Society Chair's wife suggested that the luscious food be donated to a local soup kitchen. It was donated it to Oakland County's oldest and largest homeless shelter, Grace Centers of Hope, established in 1942. Grace Centers of Hope accommodates between 150-200 men, women and children each day. Grace Centers of Hope is best known for their Emergency and Transitional Shelter for men, women and families. It is one of the largest faith-based, long-term life skills programs for those afflicted by homelessness, chemical dependency and abuse in Southeastern Michigan. Successful graduates of their program also get a chance to buy one of the rehabilitated houses in the neighborhood. Everyone at the Center expressed multiple times their gratitude and thanks to IEEE and the EMC Society for this donation.

Shown in picture are Sharan Kalwani, Southeastern Michigan IEEE Section Chair, Akio Fujimaki from the EMC Society and Dean Herzoff from Grace Centers of Hope. Pictures taken by Akio Fujimaki and Dean Herzoff.

CR Suriano, PhD, Suriano Solutions
Akio Fujimaki, EMC Society

This Month in August

Or: Notable Events in History, which I Did Not Know! ☺

Electric Traffic Light Invented, August 5th, 1914

On this day in tech history, the American Traffic Signal Co installed the first electric traffic light system at East 105th Street and Euclid Avenue in Cleveland, OH. The device used red and green lights with a buzzer that warned when the color was about to change, and allowed police and fire stations to control the signals in case of an emergency. The system was designed by James Hoge, and patented in 1918. His "municipal traffic control system" displayed electrically-powered STOP and MOVE signs mounted on posts at each corner of an intersection that were wired to a manually-operated switch housed inside a control booth nearby. The introduction of the traffic light allowed police officers directing traffic to move inside a glass booth on the corner where they controlled the light and reported accidents or emergencies.

Marvin Minsky, born August 9th 1927, died January 24th, 2016

On this day in tech history, mathematician, and co-founder of the field of artificial intelligence Marvin Minsky was born in New York. A pioneer of robotics and telepresence, Minsky has contributed to computer science in artificial intelligence, cognitive psychology, mathematics, computational linguistics, robotics, optics, and advanced technologies for exploring space. Growing up he attended private schools before serving a year in the Navy in 1944. He then received his bachelors (Harvard, 1950) and PhD (Princeton, 1954) in mathematics, and worked as a junior fellow at Harvard for three years. Minsky built the first randomly wired neural network learning machine, SNARC (stochastic neural analog reinforcement computer) in 1951. Made of 400 vacuum tubes, it was based on reinforcing the synaptic connections that contributed to recent reactions. In 1957, Minsky began working at MIT, where he was the Toshiba Professor of Media Arts and Sciences and a professor of electrical engineering and computer science, until his demise. After coining the term in 1956, Minsky and John McCarthy co-founded the Artificial Intelligence Project at MIT in 1959. Minsky famously said, "No computer has ever been designed that is ever aware of what it's doing; but most of the time, we aren't either."

Steve Wozniak, born August 11th, 1950

Inventor, engineer, computer programmer, and philanthropist Stephen Gary Wozniak, aka “Woz,” was born in San Jose, CA, on August 11, 1950. The son of an engineer who worked for Lockheed, Wozniak showed an early interest in electronics as well as ham radio, earning his ham radio operator license when he was in sixth grade. In the early 1970s, he attended the University of Colorado and then the University of California at Berkeley, but dropped out and went to work for Hewlett-Packard designing calculators. At about this time, Wozniak was introduced by a mutual friend to the slightly younger Steve Jobs, who would become his good friend and business partner. Teenagers at the time they met, Wozniak and Jobs discovered they both enjoyed playing pranks. One of the pranks they pulled together involved building a “blue box,” an electronic device that allowed them to make toll-free long-distance telephone calls (illegally). During one call, Wozniak reached an operator at the Vatican and claimed to be Henry Kissinger calling on behalf of Richard Nixon. In a video from the Santa Clara Valley Historical Association, Jobs tells the story of the blue boxes and states that “if we hadn’t built blue boxes, there would have been no Apple.” Wozniak and Jobs later raised $1300 to create the single-board Apple I personal computer kit, which Wozniak designed and built. They unveiled the product at a meeting of the Palo Alto-based Homebrew Computer Club, an informal group of electronic enthusiasts and hobbyists who first started meeting in 1975 in Menlo Park, CA. According to Wozniak, “We didn't sell very many Apple Is the first year. We built them at night in our garage. At first we expected to sell circuit boards at the Homebrew Club: just put in your own chips and it'll work. Then we got a $50,000 order from a local store and we were in heaven.”

Wozniak and Jobs, along with another partner, Ronald Wayne, formed Apple Computer on April 1, 1976. Less than two weeks later, Wayne sold his share of the company back to Wozniak and Jobs for $800. The company was incorporated January 3, 1977. (Apple removed “Computer” from its name in January 2007 to reflect an increased focus on consumer electronics.)

Electromagnetic induction discovered, August 29, 1831

Michael Faraday is credited with the discovery of electromagnetic induction on August 29, 1831. While Faraday receives credit for the discovery, electromagnetic induction may have been anticipated by the work of Italian priest and physicist Francesco Zantedeschi in 1829 or that of Joseph Henry, who around 1830 made a similar discovery, but did not publish his findings until later. Faraday formulated that electromotive force produced around a closed path is proportional to the rate of change of the magnetic flux through any surface bounded by that path. Faraday experimented by wrapping two insulated coils of wire around an iron ring. He found that, upon passing a current through one coil, a momentary current was induced in the other coil—mutual induction. If he moved a magnet through a loop of wire, an electric current flowed in that wire. The current also flowed if the loop was moved over a stationary magnet. Changing magnetic field produces an

electric field. This became Faraday's Law when it was modeled mathematically by James Clerk Maxwell. Faraday's Law became one of Maxwell's equations, which have since evolved into field theory. Faraday would later use the principles to construct the electric dynamo.

Kilby demos all-semiconductor circuit, August 28, 1958

Just weeks before the birth of the integrated circuit, Jack St. Clair Kilby of Texas Instruments, demonstrated a multivibrator circuit of discrete silicon elements to TI's Willis Adcock on August 28, 1958. Adcock had hired Kilby the May before. According to IEEE publishings authored by Kilby, his job was not fully defined when he accepted the position. "My duties were not precisely defined, but it was understood that I would work in the general area of microminiaturization," Kilby wrote in the July 1976 document, "Invention of the Integrated Circuit." He began tinkering and soon built an IF amplifier. When the plant shut down for a mass vacation during the summer, Kilby, at TI for only a short time, had no vacation time to take. He was "left alone to ponder" and sketched out a circuit made entirely of semiconductors. When Adcock returned from vacation, Kilby showed him the sketches. Adcock was skeptical and requested proof such a device would work. So Kilby – using packaged growth-junction transistors, resistors formed by cutting small bars of silicon etched to value, and capacitors cut from diffused silicon power transistor wafers – assembled and demonstrated a circuit made of discrete silicon elements.

The demonstration, while hardly what Kilby is celebrated for, was a step closer to the IC. "Although this test showed that circuits could be built with all semiconductor elements, it was not integrated. I immediately attempted to build an integrated structure, as initially planned," Kilby wrote. Weeks later, he demonstrated the first IC.

The Great North East Blackout August 14, 2003

On August 14, 2003, more than 50 million people in the United States and Canada were left in the dark thanks to one of the most wide-spread blackouts in history. The blackout began at approximately 4:10 pm ET and impacted several US states including New York, Michigan, Massachusetts, and Ohio, as well as parts of Canada, including most of Ontario. First impact turned into cascading failure and more than 508 generating units at 265 power plants shut down during the outage, an approximate loss of 80%. Beyond electrical systems, telephone and cellular systems became overloaded. Water systems were lacking pressure because pumps lacked power, which could cause contamination. August heat, reaching more than 90ºF in some parts of New York, aggravated the situation. However, looting and violence were kept to a minimum.

After immediate concerns of terrorist activity were refuted, US and Canadian investigations–as well as finger pointing–began with neither country taking blame for the event. Stated, but disputed, reasons for the blackout's trigger included a 3,500 MW power surge at the New York Independent System Operator (NYISO), lightning storms damaging equipment, the "Blaster Worm" virus infiltrating power control systems, an outage at a nuclear plant in Pennsylvania, overloading at the Niagara-Mohawk power grid, and a sudden shift in the direction of power flow on the northern portion of the Lake Erie Transmission Loop. In the end, much of the blame was placed on FirstEnergy Corp, a diversified energy company headquartered in Akron, Ohio. Its systems were said to be unreliable and inadequate at the time. However, US government authorities did not punish FirstEnergy for its role in the blackout because law at the time did not require electric reliability.

Many believed that such a blackout would not occur again after the Northeast Blackout of 1965. Indeed, safeguards were put into place to avoid cascading failure. Isolated failure had occurred on some of the same systems affected in the 1965 and 2003 blackouts during the NY Blackout of 1977. The 2003 blackout lasted more than 24 hours in some locations.

Readers are invited to share interesting ***engineering*** events or milestones that occurred in September for publication in the next month's issue. Submissions can be made using direct email to the editors at: wavelengths@ieee-sem.org

Sharan Kalwani
Just one of the Editors, Wavelengths,
2022 Chair, Southeastern Michigan Section
Passionate Engineering History Buff/Aficionado

ORG UNITS cheat sheet

Section Unit Name or Affinity Group or Chapter Name (Organizational Unit code is in parentheses)		
Consultants Network Affinity Group:	(CN40035)	
Life Members:	(LM40035)	
Young Professionals:	(YP40035)	
Women in Engineering:	(WE40035)	
Chapter: 01	(CH04049)	(SP01) Signal Processing Society, (CAS04) Circuits and Systems Society and (IT12) Information Theory Society
Chapter: 02	(CH04051)	(VT06) Vehicular Technology Society
Chapter: 03	(CH04053)	(AES10) Aerospace and Electronic Systems Society and (COM19) Communications Society
Chapter: 04	(CH04050)	(AP03) Antennas and Propagation Society, (ED15) Electron Devices Society, (MTT17) Microwave Theory and Techniques Society,
Chapter: 05	(CH04055)	(C16) Computer Society
Chapter: 06	(CH04056)	(GRS29) Geosciences and Remote Sensing Society
Chapter: 07	(CH04057)	(PE31) Power Engineering Society, (IA34) Industrial Applications Society
Chapter: 08	(CH04088)	(EMC27) Electromagnetic Compatibility Society
Chapter: 09	(CH04087)	(IE13) Industrial Electronics Society, (PEL35) Power Electronics Society
Chapter: 10	(CH04142)	(TEM14) Technology and Engineering Management Society
Chapter: 11	(CH04099)	(EMB18) Engineering in Medicine & Biology
Chapter: 12	(CH04103)	(CS23) Control Systems Society
Chapter: 13	(CH04113)	(E25) Education Society
Chapter: 14	(CH04115)	(RA24) Robotics And Automation Society
Chapter: 15	(CH04144)	(NPS05) Nuclear Plasma Sciences Society
Chapter: 16	(CH04125)	(CIS11) Computational Intelligence Society, (SMC28) Systems, Man and Cybernetics Society
Chapter: 17	(CH04128)	(NANO42) Nanotechnology Council

Section Unit Name or Affinity Group or Chapter Name (Organizational Unit code is in parentheses)	
University Of Detroit-Mercy:	(STB00531)
Michigan State University:	(STB01111)
University Of Michigan-Ann Arbor:	(STB01121)
Wayne State University:	(STB02251)
Lawrence Technological University:	(STB03921)
Oakland University:	(STB06741)
Eastern Michigan University:	(STB11091)
University of Michigan-Dearborn:	(STB94911)

Use the Geo-unit ‘Code’ for faster access in the vTools system applications.

HKN Code	HKN Name (Student IEEE Honor Society)
HKN029	University of Michigan-Ann Arbor, Beta Epsilon
HKN042	University of Detroit-Mercy, Beta Sigma
HKN054	Michigan State University, Gamma Zeta
HKN073	Wayne State University, Delta Alpha
HKN163	University of Michigan-Dearborn, Theta Tau
HKN164	Lawrence Institute of Technology, Theta Upsilon
HKN190	Oakland University, Iota Chi
HKN244	Southeastern Michigan Alumni

Organization Unit IEEE Code	Student Technical Chapter name
SBC00531	University of Detroit-Mercy, Computer Society Chapter
SBC02251	Wayne State University, Computer Society Chapter
SBC03921	Lawrence Tech University, Computer Society Chapter
SBC06741	Oakland University, Engineering in Medicine & Biology

Why do we publish this? Well, this is most useful when searching the vTools page for entering L31s or creating new events or searching for existing events!

Curated & Maintained By
Sharan Kalwani,
Chair, IEEE SE Michigan Education Society Chapter
Vice-Chair, IEEE SE Michigan Computer Society Chapter
Editor, Wavelengths,
2018~2019~2020~2021~2022

Use the Geo-unit ‘Code’ for faster access in the vTools system applications.

RoboFest Update

(1) NEW DATES for Robofest Summer Day Camps for Beginners
(2) RoboParade Oct 26
(3) 2023 Season Kickoff Dates Announced
(4) Free Robofest eAcademy Online Classes

Note: All times are listed in EDT unless noted
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(1) NEW DATES for Robofest Summer Day Camps for Beginners
We are once again hosting one-day beginner summer camps for students to get hands-on experience with LEGO EV3 or VEX IQ robots. Each camp runs from 9:00 am to 3:30 pm in-person in the Robofest Computer Science Robotics Lab on Lawrence Tech campus. Registration is open for students going into 4th through 8th Grades. More dates may be added if interest is high.

Beginning RoboParade for EV3: Tuesday, August 9, 2022
Beginning BottleSumo for Vex IQ: Thursday, August 11, 2022

$40 registration fee per team of up to 3 students / Bring your own lunch (water and snack provided). More information can be found under *Get Involved/Camps* on the Robofest.net website. https://robofest.net/index.php/current-competitions/camps0 Registration is now open.

(2) RoboParade on Oct 26
We will be hosting a Halloween themed RoboParade Wednesday October 26, 2022 from 5:00 pm ~ 8:30 pm in Robofest Lab on LTU Campus in Southfield, Michigan. Teams of up to 5 students may participate in this fun autonomous parade event. Rules can be found on the RoboParade page. Team registration will open on September 1, 2022 at www.robofest.net.

(3) 2023 Season Kickoff Dates Announced
The Robofest 2023 Season International Game Rules will be released on Saturday, October 1, 2022. We will host a series of kickoff meetings to review the rules for clarification prior to the US release in November. All rules will be finalized in January 2023.

The kickoff meetings will be held:

Friday, October 21, 2022 9:00 am (Zoom only)
Thursday, November 3, 2022 7:00 pm (In the Robofest Lab and Zoom)
Saturday, January 7, 2023 11:00 am (In the Robofest Lab and Zoom)

(4) Free Robofest eAcademy Online Classes
Robofest eAcademy is a series of online classes developed by Robofest instructors. Courses are available for free to Robofest teams through the Schoology Learning Management system. Courses have individual lessons, code samples, videos and tests for knowledge. More details can be found on the Robofest.net website under "Tech Resources eAcademy" https://robofest.net/index.php/eacademy/courses
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Dr. CJ Chung, Advisory Board Chairperson (Volunteer), cchung@ltu.edu

http://www.robofest.net http://facebook.com/robofest

Section's Conference!

Dear IEEE members:

It could not have been a better time than this to talk about the section conference. As we continue learning our resilient capabilities from the COVID pandemic, current experience of economic & geopolitical turbulence, and increasing technical challenges for higher intelligence in each area of cutting-edge technologies demand innovation and greater collaboration among the individual chapters. As we knew from our experience that the section conference events have played a vital role in the collaboration between the multiple chapters. During the past few years, the section conference activities have been stopped due to the COVID pandemic. It is a time to rejuvenate the section conference event.

I would like to take a few minutes to introduce myself. I am a Keyur Patel, and I have been Michigander for close to 10 years with 15+ years of embedded software in transportation experience, living in the Rochester community area with my son and wife. Currently, I am acting section conference chair. With the active support of ExCom Committee members and the section conference members Mr. David Mindham & Mr. Ravi Nigam, we are extremely excited to restart the section conference activity.

As we revitalize the section conference event, I would like to request your active support. Please send us your topic for a section conference with a brief high-level description and suggestions for the keynote speaker to conference@ieee-sem.org address by ***end of the August 2022***. We are targeting a section conference event around late Spring 2023.

Thank you for your support and I look forward to meeting with you all.

Keyur Patel
Section Conference Team

Activities & Events

We try to publish IEEE events in several places to ensure that everyone who may want to attend has all the available relevant information. **NOTE: The IEEE SE Michigan section website is located at http://r4.ieee.org/sem/**

SEM Wavelengths:
https://r4.ieee.org/sem/about-sem/sem-history/wavelengths-magazine-archive/

SEM Calendar of events:
https://r4.ieee.org/sem/sem-calendar/
Select "SEM Calendar" button in the top row of the website. This is our 'Active' event listing site where everyone should look first to see what events are scheduled for our Section in the near future.

SEM Collabratec Workspace:
https://ieee-collabratec.ieee.org/app/workspaces/5979/IEEE-Southeastern-Michigan-Section/activities
An IEEE supported space for online chat, discussions, connecting with other global IEEE entities, besides our local Michigan folks.

vTools Meetings:
http://sites.ieee.org/vtools/
Select "Schedule a Meeting" button in the left-hand column of buttons.

Other Happenings

Here are some of the non-IEEE functions that may be of interest to you or someone you know. Let us know if you have a special interest in a field that encourages technical study and learning, and wish to share opportunities for participation with members of the section. NOTE: Copy the URL and paste it into your browser address bar.
These websites were checked in June 2022 and found viable.
Send details to: wavelengths@ieee-sem.org OR letters@ieee-sem.org

Michigan Institute for Plasma Science and Engineering: Seminars for the 2021-2022 academic year:
https://mipse.umich.edu/seminars_2122.php

Model RC Aircraft
http://www.skymasters.org

Model Rocketry
https://www.nar.org/find-a-local-club/nar-club-locator/

Astronomy
http://www.go-astronomy.com/astro-clubs-state.php?State=MI

Experimental Aircraft Association
https://www.eaa.org/en/eaa/eaa-chapters/find-an-eaa-chapter

Robots
https://www.robofest.net/index.php/about/contact-us

Science Fiction Conventions
https://2021.penguicon.org/

http://www.confusionsf.org/

Mad Science
http://www.madscience.org/

ESD PE Review Class
https://www.esd.org/programs/pe/

Maker Faire:
https://swm.makerfaire.com/

It appears that the SouthWest Michigan Maker Faire was a casualty of the Global Pandemic, as were many of our friends and several organizations.

However, we retain this link for anyone wishing to make contact and consider pumping life back into what was a wonderful experience.

Executive Committee

The SEM Executive Committee is the primary coordination unit for Southeastern Michigan (SEM) IEEE operations. The basic organization chart below shows the 2019/2020/2021/2022 arrangement of communications links designed to provide inter-unit coordination and collaboration.

The SEM Executive Committee meets in a teleconference each month on usually on a Thursday at 6:30 pm. The specific meeting days, times, phone or WebEx numbers and log in codes are published on the IEEE SEM Website calendar: **http://r4.ieee.org/sem/** Click on the "Calendar" button in the top banner on the first page of the web site.

If you wish to attend, or just monitor the discussions, please contact **Christopher Johnson**, the section secretary at secretary@ieee-sem.org and request to be placed on the distribution list for a monthly copy of the agenda and minutes. More meeting details are available on the next page of this newsletter.

Other Meetings:
About half of our members maintain memberships in one or more of the IEEE technical societies, which automatically makes them members of the local chapter which is affiliated with that society. As a result, they should receive notices of the local chapter meetings each month.

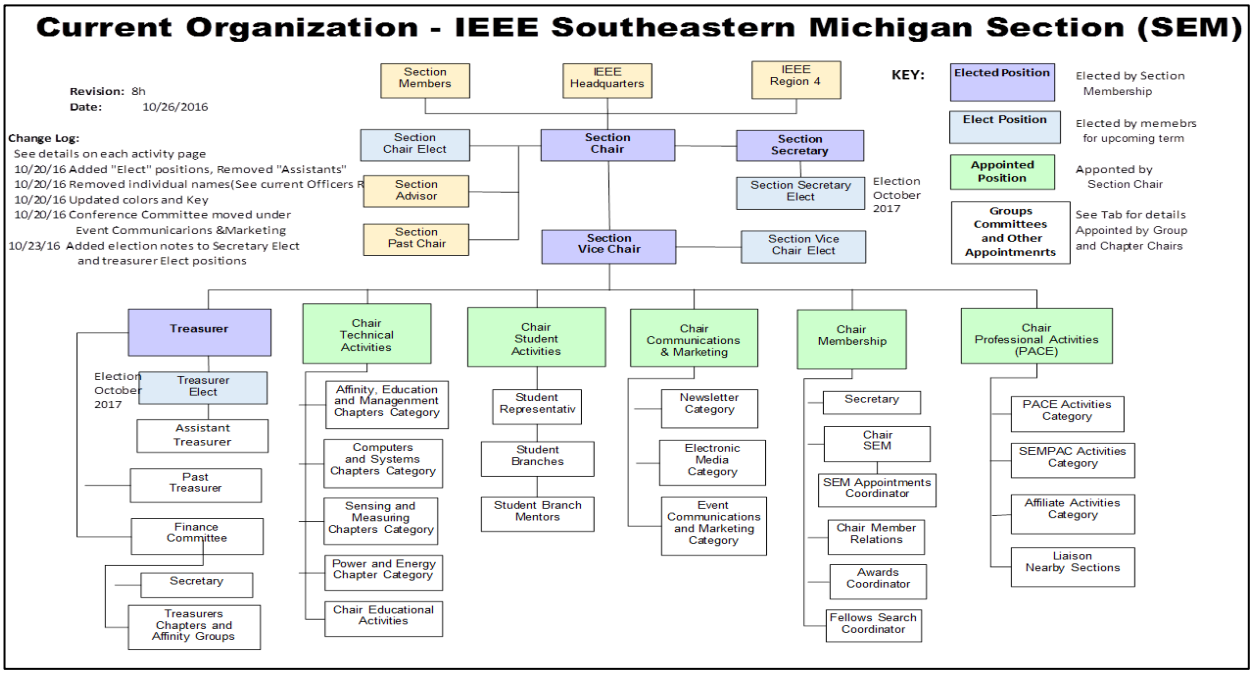
However, members of the section may have multiple technical interests and would like to have meeting information of other chapters. In order to communicate the meeting dates of all the chapters, affinity groups etc., to our members to facilitate their attendance, leaders of the groups are requested to send meeting information to our webmasters for posting on section's calendar.

More detailed information on meetings may be found through the IEEE SEM Website: **http://r4.ieee.org/sem/** and clicking on the **SEM meetings list** button near the bottom of the left-hand banner.

Automatic e-mail notification of web updates may be received using the "**Email Notifications**" button at the top of the **SEM Tools/Links** side banner.

Christopher Johnson (Secretary)
Email: secretary@ieee-sem.org

If you wish to download the complete SEM Organization Chart, in PDF format, it will be made available soon at http://r4.ieee.org/sem/ . In the meantime, you may use the diagram below (soon to be refreshed!)



ExCom Meeting Schedule

NOTE: All SEM members are invited to attend ALL ExCom (Executive Committee) meetings:

Below is the 2022 schedule for the Section ExCom meetings with links to add the events to your calendar. It is important that at least one person from each Chapter/Affinity Group attends each scheduled ExCom meeting. Please mark your calendars for the 2022 meetings. Or, link your personal calendar to the SEM Web calendar.

Section Administrative Committee (ExCom) Meeting Schedule for 2022:

Note: All IEEE Members are welcome at any IEEE meeting, at any time but please register so we can be sure to accommodate you. This month's meeting is highlighted in **Bold**.

ExCom Meeting	*Date & Time*
August 04,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for August 2022 https://events.vtools.ieee.org/m/289872	6:30 PM
Sept 01,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for September 2022 https://events.vtools.ieee.org/m/289873	6:30 PM
October 06,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for October 2022 https://events.vtools.ieee.org/m/289875	6:30 PM
Nov 03,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for November 2022 https://events.vtools.ieee.org/m/289876	6:30 PM
Dec 01,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for December 2022 https://events.vtools.ieee.org/m/289877	6:30 PM

Christopher Johnson (Secretary)
Email: secretary@ieee-sem.org

Editorial Corner

Previous editions in this series may be found on the IEEE SEM website at: http://r4.ieee.org/sem/. Click on the "Wavelengths" button in the top row of selections.

Comments and suggestions may be sent to the editorial team at wavelengths@ieee-sem.org
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We rely on our officers and members to provide the 'copy' that we finally present to readers of the newsletter.
The **Wavelengths Focus Plan and Personal Profiles** plan shown in the matrix below is presented to ensure coverage of section activities and events.

We try to complete the newsletter layout a week before the first of the month to allow time for review and corrections. If you have an article or notice, please submit it two weeks before the first of the month or earlier if possible.

The plan below relies on the contributions of our members and officers, so please do not be shy. If you have something that should be shared with the rest of the section, we want to give you that opportunity.

We always encourage all chapters and student branches to share news of activities (both past and future) in their arenas. Please feel free to share any and all information so your peers, colleagues can hear about all the good work you do.

Quote:
"If a tree falls in a forest and no one hears it, how do you know it actually fell??"

So, publicize your work, one never knows when it can pay off!

Editors:

We are always looking for members interested in helping to edit the newsletter. The process is always more fun with more people to share the duties. Having more participants and contributors also helps us keep the newsletter interesting.

Join the Team:

If you feel you might like to join the team, or would like to train with us, please contact one of us at:
wavelengths@ieee-sem.org

Sharan Kalwani,
Chair, IEEE SE Michigan Education Society Chapter
Vice-Chair, IEEE SE Michigan Computer Society Chapter
Co-Editor, Wavelengths,
2018~2019~2020~2021~2022

Wavelengths Annual Publication Plan for Articles

Month	AG's	Ch's	Ch's	SB's	Special Notice	Reporting Events	Monthly Focus	Awards
Jan		*1*		*OU*	*New Year Officers*	*Officer's Welcome*	*The Year Ahead*	
Feb	*Cons*	*2*		*MSU*	*Science Fair Judges*	*National Engrs Wk.*	*Surviving Winter*	
Mar		*3*	*13*	*EMU*	*Elections - Prep*			
Apr		*4*		*U/M-D*		*ESD Gold Awards*	*Chapter Focus*	
May	*Life*	*5*	*14*			*Science Fair*		
Jun		*6*					*Leadership Skills*	
Jul		*7*	*15*				*Students Issues*	
Aug	*WIE*	*8*			*Nominations Call*		*Womens Issues*	
Sep		*9*	*16*	*LTU*	*Ballots*	*Engineers Day?*	*Professional Skills*	
Oct		*10*		*U/M-AA*	*Elections!*	*IEEE Day*		
Nov	*YP*	*11*	*17*	*WSU*	*Election Results*	*New Fellows*		
Dec		*12*		*U/D-M*	*IEEE-Com Apmts.*		*Happy Holidays*	*R4 Nom*

Wavelengths Annual Publication Plan for Personal Profiles

Month	Profiles	Profiles	Committees
Jan	Chair	New Officers	ExCom
Feb	Treasurer		Communications
Mar	Secretary		Conference
Apr	Stud-Rep		Education
May	V-Chair		Executive
Jun	Sect-Adviser		Finance
Jul	Sr Officers		Membership
Aug			Nominations
Sep			PACE
Oct			Student Activiies
Nov			Technical Activiies
Dec	Editor-WL		

IEEE Southeastern Michigan
Electrical and Electronic Engineers Creating Our Future

Web & Social Sites

SEM Website
http://r4.ieee.org/sem/

Each of the sites below may be accessed through the SEM Website:

Section Website Event Calendar
(Select the "SEM Calendar" button - top row)

SEM Facebook Page
(Select the "f" button under the top row)
https://www.facebook.com/groups/ieeesemich

SEM LinkedIn Page
(Select the "in" button under the top row)
https://www.linkedin.com/groups/1766687/

SEM Twitter Account (new)
(Select the "t" button under the top row)
https://www.twitter.com/ieeesemich

SEM Collabratec Workspace (new)
https://ieee-collabratec.ieee.org/app/workspaces/5979/IEEE-Southeastern-Michigan-Section/activities

SEM Officers:
For a complete listing of all - Section - Standing Committee - Affinity Group - Chapter and Student Branch Officers, see the SEM Officers Roster on the SEM web page under the "About SEM" button and select "Organization Roster"

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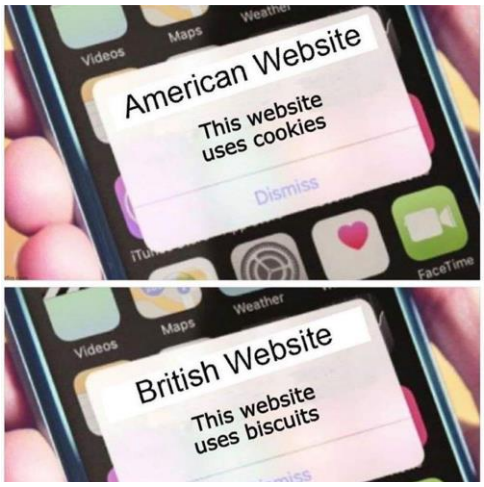
Visit Us on the Web at:
http://r4.ieee.org/sem



Leadership Meetings

SEM Executive Committee Monthly Teleconferences:

- 1st Thursday of Each Month @ 6:30 PM
- Check the Section Web Calendar at:
  http://r4.ieee.org/sem/sem-calendar/
  (Select the "SEM Calendar" button in the top row.)

SEM Executive Committee Meetings:

- Find the location, and Registration at:
  http://bit.ly/sem-ieee

SEM Standing Committee Meetings:
SEM Affinity Group Meetings:
SEM Technical Society/Chapter Meetings:
SEM University Student Branch Meetings:

- Meeting schedules are announced on SEM Calendar
  http://r4.ieee.org/sem/
  (Select the "SEM Calendar" button in the top row.)

- Registration for all at:
  http://bit.ly/sem-upcoming