Wavelengths

Volume 64 – Issue 8

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Upcoming Events

We have several events coming up this month, all are listed below, FYI.
Note: All times are EST/EDT. If any events are missed do kindly bring them to the attention of wavelengths@ieee-sem.org. Enjoy!
You can also use this bookmark to view All of the links at a single glance
http://bit.ly/sem-upcoming

Event	Date	Time
2024 Consumer Electronics Show: A Review	August 01	1200 hours
Documentary Night: The Codebreaker	August 09	1700 hours
Computer Chapter Admin meeting	August 05	1930 hours
CHAPTER 1 – Volunteers Search for Secretary, and Treasurer	August 06	1205 hours
Careers in Technology Summer Series 2024	August 06	1900 hours
TEMS EXCOM August Chapter meeting	August 07	1830 hours
Section ExCom Monthly Meeting (virtual)	August 08	1830 hours
Life Members Affinity Group - Admin Meeting	August 12	1200 hours
Careers in Technology Summer Series 2024	August 13	1900 hours
Careers in Technology Summer Series 2024	August 20	1900 hours
Transmission Planning for Renewable Energy and Load Growth	August 28	1800 hours

Chair's Column

What to look forward to this month of August:

- ✓ July is now behind us, and the proverbial dog days of August are here. Despite that, we have a lot of events to look forward to. But before we plunge into those details, a look back at July. We had a modest amount of activitie, but still high quality! I think all of our Southeastern Michigan community should be proud of this and step forward to continue raising the profile of the section and its various chapters. See the graphic charts on our YTD performance and in the TACom report. We were on track to exceed last years total # of activities (all inclusive) but there is still time!
- ✓ We recently hosted yet again 1 more Distinguished Speaker – this time the topic was "Lethal Autonomous Robots and the Noncombatant", by Dr Ronald Arkin of Georgia Tech U. This event was virtual. Let me know if you wish for a copy of the recording and slides.

- ✓
- ✓ ***SAVE THE DATE (2024-09-21)!*** ***The IEEE is now 140 years old.*** We have an active volunteer planning committee going. The venue has been decided – it is the Wright Museum of African American History in Detroit, Michigan. You can look up details about this at https://thewright.org . We are still open to other ideas on the celebration program. We have invited several IEEE leaders and a speaker from the IEEE History center. They will share a lot about the IEEE and our contributions to society. In addition we will have member awards and recognition, a sumptuous dinner, museum tour and memorable eclectic entertainment. Send your suggestions/ideas/emails to 140@ieee-sem.org

Volunteering:

- ✓ We, IEEE Southeastern Michigan Section, function based on the work of our volunteers. If someone has important obligations that reduce their ability to volunteer, other volunteers need to step in and carry the load. The more volunteers we have, the easier the workload on everyone. Please volunteer, you will find the experience interesting and rewarding. There is a dedicated article on volunteering elsewhere in this edition.

What to look forward to:

- ✓ We have a ton of activities planned in AUGUST:
  - First person review of CSE 2024!
  - Series of Careers in Technology – done in co-operation with several Sections across Regions!
  - Transmission Planning (IN PERSON event w/ dinner)
- ✓ Look for the flyers in this issue, but to list a few:
- ✓ Several highly acclaimed documentaries (with a few new ones too!):
  - The Codebreaker
  - Lord Kelvin and
  - Rachel Carson – Author of Silent Spring

You can find ALL the other upcoming events using the short URL link: **https://bit.ly/sem-upcoming**

Remember – every little bit helps, and the Section is here to help! If you have not taken the opportunity, do reach out to any of the Section officers (lifelong email contacts listed below). Who knows what unknown but immense value you may discover, by simply connecting with us. A possible membership annual rate discount, OR an upcoming soft skills event OR need of a professional member for a technical person resource OR opportunity to participate in a standards making process OR a chance to mentor a young graduate student in a domain badly needed in our section of the world OR network with a book publisher OR….the possibilities are limited only by your enthusiasm.

Finally, I ask you to help share news about our IEEE Section to fellow engineers. This will help us fulfill the mission and goals, which is to use technology to help society. Do help us gain more visibility – word of mouth, invitations to our tech events, skills, join as members, post our events to your social media feeds, etc.

Also of note – we take a great deal of interest in our members welfare. The ***5th senior member elevation*** event is taking place soon (September 14th). See the announcement in this issue. Note we have been timing these 3 weeks before each A&A panel meeting!

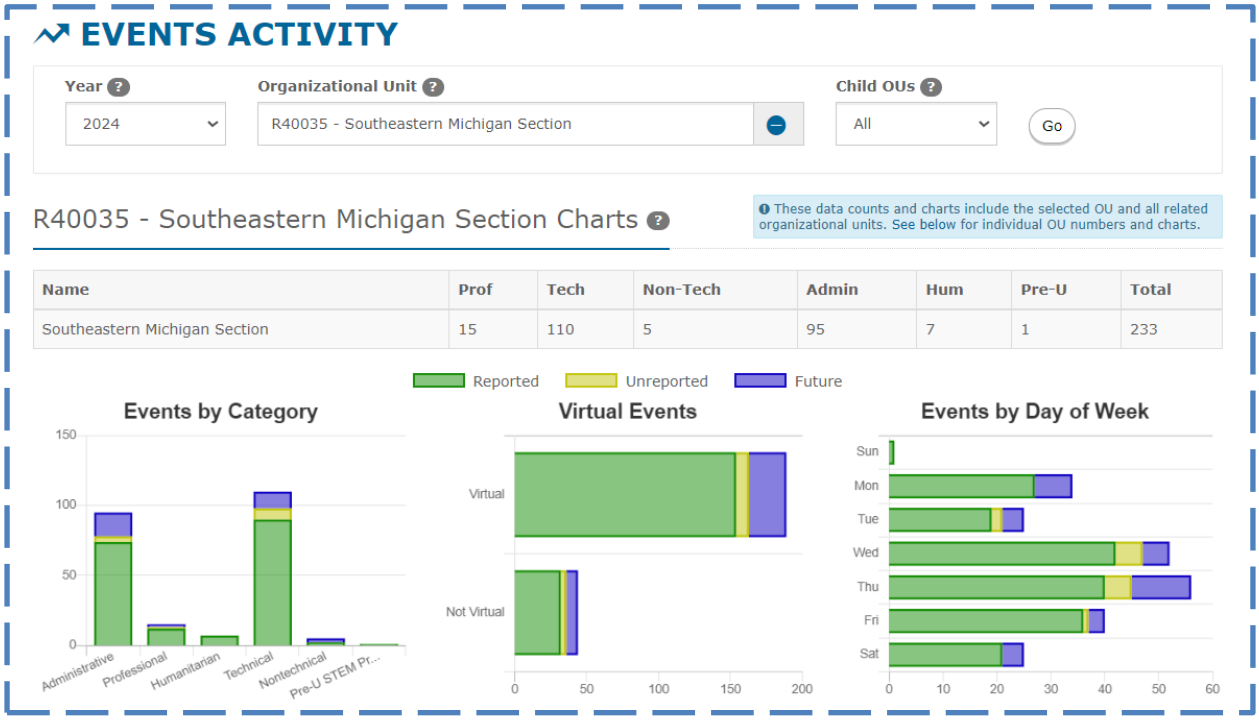
I look forward to hearing from you and seeing you at our events. As always, your ideas and suggestions are encouraged and welcome. If I don't hear back (good or bad) I will assume all is well 😊

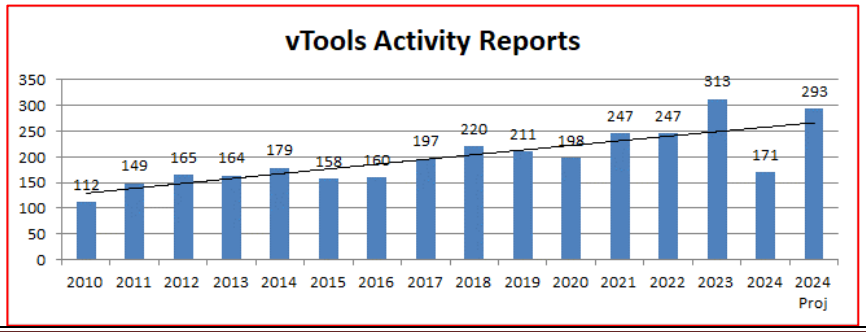
Sharan Kalwani
Via email: chair@ieee-sem.org

Section members are encouraged to engage using any of these online platforms:

To reach any of our SECTION officers, for any help/assistance you seek you may try these easy to remember email addresses. The objective is to ensure business continuity, so one need not try to remember or hunt for the contact information! They can help you find your chapter officers or point you in the right direction for any query. They are:

- Chair is chair@ieee-sem.org
- Vice Chair is vicechair@ieee-sem.org
- Treasurer is treasurer@ieee-sem.org
- Secretary is secretary@ieee-sem.org
- Advisor is advisor@ieee-sem.org
- 140th event celebration team: 140@ieee-sem.org





Tech Activities REPORT

Report ending: July 28th, 2024

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	0	0	0	0	1	0	Consultants Network	0	1
LIFE	0	0	0	7	0	0	Life Members	0	7
WIE	29	21	2	6	2	0	Women In Engineering	0	10
YP	6	0	1	6	0	0	Young Professionals	1	7
1	0	0	0	3	0	0	Circuits & Systems, Signal Proc., Info Th.	0	3
2	117	21	4	3	0	0	Vehicular Technology	1	7
3	0	0	0	0	0	0	Aerospace & Elec. Sys., Communications	0	0
4	29	0	5	0	0	0	Trident (Ant, Elect Dev., uWave, Photo)	0	5
5	51	6	37	6	4	4	Computers	0	51
6	19	1	3	0	0	0	Geoscience & Remote Sensing	0	3
7	55	2	2	4	0	1	Power Engineering, Industrial App.	1	7
8	81	37	8	6	0	0	Electromagnetic Compatibility (EMC)	1	14
9	107	0	1	5	0	0	Power Electronics, Industrial Electronics	1	6
10	4	1	1	4	0	0	Engineering Management	0	5
11	0	0	0	2	0	0	Eng. in Medicine & Biology	0	2
12	16	2	1	1	0	0	Control Systems	0	2
13	0	0	0	0	0	0	Education	0	0
14	23	0	2	1	0	1	Robotics & Automation	0	4
15	29	0	5	0	0	0	Nuclear Plasma Science Society	0	5
16	0	0	0	1	1	0	Computational Intelligence / Sys.Man.Cyber.	0	2
17	16	1	3	0	0	1	Nano Technology Council	0	4
18	0	0	0	1	0	0	Magnetics Society	2	1
									0
SEM	111	61	3	17	4	1	SEM (Section)	4	25
Tot	693	151	78	73	12	8	NOTE: Highlight Green = Active	11	171
		22%					NOTE: Highlight clear = Concern		

SEM Section Chapter and Affinity group leaders who are not showing any technical or administrative meetings are encouraged to reach out to the TAcom for assistance. Those chapters and groups with unreported meetings please update your L31 reporting. Please refer to the Section Health snapshot. During a TAcom meeting this month actions were discussed to become more engaged with our Student Branch and Awards and Recognition committees. Plans are also being put into place to aide chapters with conducting this year's Section elections. We continue to exceed our projections for technical meetings hosted for our membership. Thanks to all GAs working to engage their membership.

V/r Jeffery V. Mosley
Chair, Technical Activities Committee (TAcom)
jvmosley@ieee.org
Southeastern Michigan Section, IEEE Region 4

This Month in August

Or: Notable Events in Engineering & Science 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

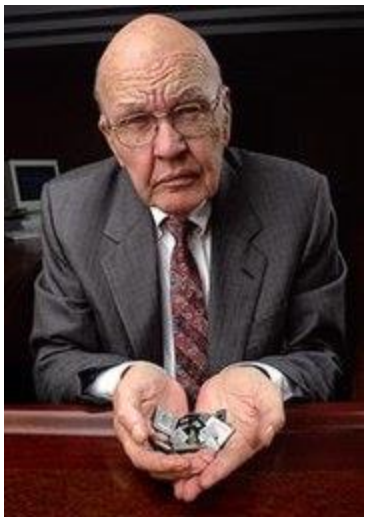
Inventor, engineer, computer programmer, and philanthropist Stephen Gary Wozniak, aka “Woz,” was born in San Jose, CA, on August 11, 1950. The son of an engineer who worked for Lockheed, Wozniak showed an early interest in electronics as well as ham radio, earning his ham radio operator license when 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.

John Logie Baird, Born August 13, 1888; Died June 14, 1946
Scottish inventor, electrical engineer, and innovator, John Logie Baird, is best known for demonstrating a working TV system in 1926. He then went on to invent the first viable purely electronic color TV picture tube and founded the Baird Television Development Company. He was inducted into the Scottish Engineering Hall of Fame in 2015.

Margaret Hamilton, Born August 17, 1936
Credited with coining the term software engineering, computer scientist and systems engineer, Margaret Heafield Hamilton served as the Director of the Software Engineering Division of the MIT Instrumentation Laboratory, overseeing the development of the on-board flight software for NASA's Apollo program. A prolific writer, she is also the founder of two software companies; Higher Order Software and Hamilton Technologies.

Charles Kettering, Born August 29,1876; Died November 25, 1958
Charles F. Kettering was an American engineer, inventor, and businessman. Kettering is credited with founding Delco Electronics Corporation. Holder of 186 patents, Kettering is also credited with the invention of Freon refrigerant for air conditioning and refrigeration systems. Over the course of his career, Charles F. Kettering won prestigious awards like the IEEE Edison Medal, Hoover Medal, and Franklin Medal.

Godfrey Hounsfield, Born August 28, 1919; Also died in the month of August 12, 2004
Nobel Prize-winning British electrical engineer Godfrey Hounsfield is best known for developing the CAT and CT scan techniques along with Allan Cormack. He also led the team that developed Britain's first all-transistor computer. He was knighted for his achievements, while the measure of radiodensity was named the Hounsfield scale.

This continues the yearlong feature of interesting ***engineering*** events or milestones that occurred in a specific month. Readers are invited to share their views and opinions (or suggestions) at the accompanying link. Submissions can also be made using direct email to the editors at: wavelengths@ieee-sem.org.

Past readers have asked to feature one or more of these events in more detail. So, starting in January 2024, we have been featuring both documentaries and black & white movies, that will help shed more light on these luminaries and also explore the hidden side of their life stories. We will also endeavor to republish an article from various publications in the same month of Wavelengths.

Here is a link which lists all of the documentaries featuring several of the folks mentioned in past *"This month…."* series. Enjoy!

Sharan Kalwani
2022-2024 Chair, Southeastern Michigan Section,
Passionate Engineering History Buff/Aficionado

Elections 2024

We send an eNotice, and an article in the newsletter, to all our Section members in advance of our yearly elections.
In the past, IEEE MGA required us to notify all eligible voters 6 months before an election is planned. A new, revised procedure reduces the timeframe to 4 months.

This new process requires direct involvement by each and every Geo-unit.

This year's recommended schedule from MGA HQ is as follows:

Task:	Sample Date:	Duration:
Appoint Elections Committee	1 August	Start no later than 1 August
Call for Nominations Issued	5 August	Open 30 days minimum - required
Call for Nominations Closed	5 September	
Candidates Reviewed	6-12 September	On average 7 days
Slate Approved by ExCom	13-19 September	On average 7 days
Region Director Approval *(if necessary for single candidate slate)*	20-26 September	On average 7 days
Slate Announced and Petition Opens	27 September	Open 30 days minimum - recommended
Petition Closed	27 October	
Petition Candidates Reviewed	28 October-3 November	On average 7 days
Final Slate Approved by ExCom	4-10 November	On average 7 days
Final Slate Announced	11 November	
Voting Opens	11 November	
Voting Closes	25 November	Open a minimum of 2 weeks - required
Final Results Announced and Officers Recorded	15 December	Announce results no later than 15 December

This year we elect our 2025 set of officers for all Geo-units (Affinity Groups & Technical Chapters).
Those officers include the Chair / Vice-Chair / Secretary / Treasurer.

Links to MGA training materials, including recordings of their virtual training session may be found as listed below:

MGA Geographic Unit Election Training Materials

15 July 2024 Training:

1. Slides:
   - https://docs.google.com/presentation/u/0/d/1ONfiVkhbDO9P9LVgjP-Pqut6THzZmAFH/edit?fromCopy=true&ct=2
2. Recording:
   - https://ieee.webex.com/webappng/sites/ieee/recording/64a1ae90253d103dabfc9a7245ce3034/playback

Links to frequently asked questions may be found at:
https://docs.google.com/document/d/1L0s5SMZTgtokTFRHwjDlcNLAn7YxWqePukU5zpp6kwM/edit

Links to most Job Descriptions may be found on the SEM Volunteer Portal at:
https://r4.ieee.org/sem/aboutsem/volunteer-portal/.

Links to the Affinity Groups and to the Chapters may be found at:
https://r4.ieee.org/sem/aboutsem/sem-chapters/

Note: Student Branches and HKN Chapters elect their officers on their individual schedules independently on their own.

Direct questions to: K.williams@ieee.org

Helpful information for Chapters and Affinity Group Leaders as you prepare for your Geographic Unit Elections:

- Each Chapter and Affinity Group should establish an Elections Committee, comprising of 3 Chapter or Affinity Group members who ideally are not current Chapter/Affinity Group Officers (Chair, Vice Chair, Treasurer and Secretary) and who are not putting themselves forward for consideration for the slate of officer positions.
- One current Officer can serve on the Election Committee but cannot be its Chair.
- The position of "Teller and vTools lead" on the Election Committee can be filled by any member of the Section (does not have to belong to the Chapter/Affinity Group forming the Committee).
- If there are still issues getting volunteers for the remaining positions on the Elections Committee, please reach out to the Section Chair for alternatives such as aligning with Section Elections (having the same Election Committee) or granting exceptions.
- The Region shall be informed of any such exceptions or alternatives.
- The Nominations/Elections Tool is not yet available for Chapters, Chapters and Affinity Groups can form the Election Committee manually.
- Chapters and Affinity Groups can use eNotice to send out the Call for Nominations and use vTools Voting.

vTools Training:
Many of our officers and members may not be familiar with the special electronic 'tools' that have been developed by the IEEE committees working with MGA (Member Geographic Association) designed to help officers in IEEE Chapters, Affinity Groups, Student Branches and HKN Chapters. The use of some of those tools (see insert to right) will help by making several of the election tasks much easier. (Note the tools shown in **bold** text.)

Doodle
IEEE Events Finder (Android)
IEEE Events Finder (iOS)
IEEE Functional Alias Request Form
IEEE Membership Validator
IEEE OU Analytics
IEEE Web Hosting
Other Volunteer Tools
Remote Conferencing
Survey Access Request Form
vTools Engage
vTools eNotice
vTools Events
vTools Local Groups
vTools Nominations
vTools Officer Reporting
vTools Student Branch Reporting
vTools Voting
WebEx Request Form

Access the vTools main page at: **https://vtools.ieee.org/**
Note: To use some of the vTools, each active officer or committee member must be listed in the vTools Officer Reporting tool for the specific Geo-unit (Chapter / AG). The current Geo-Officers (especially the Chair) has the authority to appoint members of his/her Geo-unit to committee posts as needed. (These appointed officers do not need to run for election.)

When the vTools page is opened, in the top header bar you should notice the '**Tutorials**' Button. This will take you to the page where you can select detailed tutorials covering the use of each of the commonly used vTools.

The vTools most needed during elections are **eNotice, Membership Validator, Officer Reporting** and **Voting**. Each of these tools has a specific tutorial, except for the Membership Validator. This tool is so straightforward and self-explanatory that it only requires knowing the member's IEEE Member number, or the email address the member uses in their IEEE personal profile. The member number is the most reliable, since many members sign up as IEEE members using one email then routinely chose to use a different email for their normal communications.

Once the members IEEE number is entered the tool returns enough information to determine if the member is: **Active**, their **Grade**, (Students may not hold a Chapter or AG office – Graduate Students are OK.) and which **Societies** they belong to. Candidates for office must reside in the Section, be an Active member, and belong to at least one of the supporting Societies or Affinity Groups which is the focus of the election.
See the example at the right:

Membership validation status
First and last name initials: K. W.
Membership status: Active
IEEE member grade: Life Senior
Standards Association Member: Yes
Society membership(s):
- IEEE Antennas and Propagation Society Membership
- IEEE Electromagnetic Compatibility Society Membership
- IEEE Geoscience and Remote Sensing Society Membership
- IEEE Magnetics Society Membership
- IEEE Microwave Theory and Technology Society Membership
- IEEE Oceanic Engineering Society Membership
- IEEE Product Safety Engineering Society Membership
- IEEE Society on Social Implications of Technology Membership
- IEEE Technology and Engineering Management Society Membership
- IEEE Vehicular Technology Society Membership

Occasionally we have a member who joined IEEE in another section and move to Michigan and forget to update their personal profile to show that they are now located in our Section. To allow them to stand for election they only need to update their IEEE personal profile.

Unfortunately, the Membership Validator does not show the Section of record, and only when using the Voting tool will it be evident when an error message indicates the candidate is not a resident of the Section.

Officer Training
We encourage members who are considering running for an officer position to take advantage of the 'Training Materials' available on the IEEE SEM Website at: **https://r4.ieee.org/sem/aboutsem/training/**

FREE Voice over Power Point Training: On-line virtual training modules are available through the SEM Website Training page. These videos will play directly and immediately from Google Chrome browser. They may not work well using Internet Explorer.

Turn OFF your pop up blocker if you don't see it load or download.
Blank Titles (Links) are in development.

(If you wish to rewind sections and play again, we suggest you download the module to your computer and play it using your systems 'media player'.)

Note: If you are beginning training, we recommend starting with Module # 46: Virtual Training Plan, and follow its recommendations for the training sequence. Send Questions about these Training Modules to: **k.williams@ieee.org**

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Retire…to What?

Many years ago, when I worked for a company that celebrated each retirement of its employees and invited any who had retired to return and join in its quarterly employee gatherings, I noticed consistent characteristics among the returning employees after 1 year of retirement. The ones who returned looked 10 years younger than when I had last seen them, and to a person they all said they "…did not know how they had time to work when they were employed because their life was so full of 'stuff' to do."

I also noticed those occasions when we would attend a retirement party, have coffee and cake with the person retiring and wish them well. A few months later, we would receive notice of their funeral. My suspicion has always been that those who passed away had gone home, turned on their TV set and just sat there.

Since I retired from earning a living, I have asked others about this phenomenon, and there seems to be general agreement that we would prefer to be 'too busy' rather than the evident alternative. One option has always been to devote any 'spare time' (whatever that might be) to a personal hobby or maintain connections with a professional society (IEEE? For example), community service, adult education classes, another degree, etc.

IEEE Elections this year will see some new procedures initiated by the Member Geographic Association (MGA) that will require active participation by members or each Technical Chapter, or Affinity Group – who are not currently officers – to setup and operate a committee to nominate and elect new officers for the next year. What a great opportunity to directly engage with others within the same interest group, get experience working with others in the Section, and MGA staff at IEEE HQ a well! The detailed process description is provided at:
https://kb.ieee.org/vtools/blog/kb/vtools-nominations/

Morse Code has always been my personal passion as a function of my 'hobby' Ham Radio, i.e. Amateur Radio. Keeping Morse code alive and well has been fun and since retirement has become more of an 'avocation' than simply a way to communicate over radio.

In 2020 I ran across a new organization called the 'Long Island CW Club'. For the uninitiated, CW refers to 'Continuous Wave', which is how Morse code is sent over the air. In the early days of radio RF signals were generated using powerful spark (arc) transmitters. Usually in the 500 to 1,000 watt power ranges. When Edwin Armstrong invented the RF oscillating circuit in 1912 he initiated a revolution in radio which allowed the generation of single frequency signals, instead of the very broadband sparks which ate up large swaths of the radio spectrum. Called 'continuous wave' (CW) this new system allowed many stations to operate latterly side by side without interference with one another!

Back to the Long Island CW Club. This organization developed to teach the use of Morse Code using the media of ZOOM over the internet. This way it was able to reach beyond the local club teaching code classes to a few students one a week to teaching many students every day. When I joined the LICW, I was member #160. When last I looked at the main website the membership totaled 5,350 in all 50 states and 59 countries teaching 138 classes each week. The growth rate has been nothing less than astounding, and the success rate for students either returning to Ham radio when they retired and finally had time or first time just wanting to learn 'the code' has been remarkable.

First time students include youngsters as young as 5 years old, who have mastered Morse code and gone on to get their Amateur Radio licenses, to some older than me (…and I'm older than dirt!) who have gone from 'no code at all' to becoming CW Traffic Net managers in the American Radio Relay League National Traffic System leading daily gatherings (Nets) of experienced Morse code traffic handlers to support the systems that provide communications back up to the US Government emergency services when disaster strikes our communities. I point this out since my own research has shown that the number of engineers within the IEEE who either are Amateur Radio operators, or were 'Hams' earlier in their lives, or who maintain an 'interest' in becoming Hams, 'when time permits', runs about 90 time the USA national average! Internal polls also show that Hams who learn and use Morse code stay 'active' longer and stay 'engaged' with their local Amateur Radio organizations.

If you are one of those who thought that 'Ham Radio' might be something for you to try 'when you retire', this may be a worthwhile path for you. If you do decide to give 'Ham Radio' a try, consider learning Morse code, 'Radio's first language', as part of your journey.
https://longislandcwclub.org/

Kim – N8FNC

CES talk: August 1

IEEE Southeastern Michigan
Presents a Review of
Consumer Electronics Show: 2024

IEEE Southeastern Michigan
Electrical and Electronic Engineers Creating Our Future

The Consumer Electronics Show (CES) is a top-tier technical platform hosting the greatest and latest innovations in a variety of fields including and not limited to consumer applications, healthcare, automotive, telecommunications, cybersecurity, robotics, smart homes, sustainability, and artificial intelligence. This session deep dives into general trends in automotive industry and highlights a few non-automotive observations demonstrated at CES 2024.

Speaker Bio:

Agasthya Ayachit, Ph.D., is a Staff High-Voltage Systems Engineer at Mercedes-Benz Research and Development North America. He received his Ph.D. in Electrical Engineering from Wright State University in 2018. Since joining Mercedes-Benz, he has been actively contributing to the design and development of power conversion stages in electric vehicle battery charging and eDrive systems. He has published several conference and journal articles in domains related to small-signal modeling, magnetics, resonant topologies, hard-switched dc-dc converter stages, electric vehicle charging. He has co-authored 2 book publications and owns several patents in electric vehicle space.

Quick Summary

- **When:**
  Date: August 1st , 2024
  Time: 12 noon (EST/EDT)
- **Where:**
  ONLINE/Virtual via WEBEX
- **Audience: OPEN to ALL**

Sponsored by IEEE Southeastern Michigan Power Electronica Society Technical Chapter

***Pre-Registration Required!**

https://events.vtools.ieee.org/m/428983

IEEE Southeastern Michigan Section

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE Advancing Technology for Humanity

140 YEARS

Senior Member News

The IEEE southeastern Michigan Section is extremely proud and happy to welcome members, who recently got upgraded to senior status. It is all part of our Membership Development on-going initiative to play a role in the professional lives of our members and support them in every which way possible. Congratulations to all and feel free to contact them.

Mohamad Berri & Sharan Kalwani.
Membership Development committee

Jian Tang received the B.S. degree and the M.S. degrees in automotive engineering from Jiangsu University, Zhenjiang, Jiangsu, China, in 2008 and 2010, respectively, and the Ph.D. degree in mechanical engineering from Michigan State University, East Lansing, Michigan, USA, in 2022. He is currently a Senior Software Engineer at Robert Bosch LLC, specializing in ADAS Software-in-the-Loop (SIL) and radar model development. He has 7 years' experience in control design and development of chassis system in Chang An Auto and Nexteer China. His current work and research interests include automotive system modeling and control, ADAS SIL development, data driven based control and optimizations.

Alexey Tonyushkin received MS and Ph.D. degrees in physics from New York University, USA. He spent three years as a postdoctoral fellow in the Department of Physics at Harvard University, working on atom interferometry sensors. He then held an appointment as an MRI clinical physicist at Massachusetts General Hospital and Harvard Medical School. He then established his Magnetic Particle Imaging research laboratory in the Department of Physics at the University of Massachusetts Boston followed by a faculty position in the Physics Department at Oakland University, MI as an Assistant Professor.

His research interests include hardware development and clinical applications for a new imaging modality – Magnetic Particle Imaging. He holds two US patents, published peer-reviewed works, and contributed to numerous conference proceedings on magnetic particle imaging, ultra-high field MRI, magnetic traps for cold atoms, atom sensors, atom and molecular spectroscopy technique. He is a member of the review panels at the National Institute of Health and European funding agencies. He is an active reviewer for many journals and conferences in applied and general physics and medical imaging. He is a member of the Editorial Board of the International Journal on Magnetic Particle Imaging, Medical Physics, and Atoms; and a Co-Chair of the 9th International Workshop on Magnetic Particle Imaging.

Next Senior Elevation

IEEE HQ Admission and Advancement (A&A) Review Panel Meeting Schedule

The Admission & Advancement (A&A) Review Panels meet six times annually to review applications and/or nominations for election or elevation to Senior Member (SM) or Life Senior Member (LSM) grade.

- The review panel meetings are held in various locations throughout the world.
- A panel of reviewers is recruited among Senior members, Life Senior members, and Fellows in the section where the meeting is to be held. This full-day session is presided over by the Admission and Advancement Chair and/or Vice Chair, as well as a representative of the Member and Geographic Activities staff.
- **In order for an application to be reviewed at the next Panel meeting, the application, resume, and required reference forms have to be submitted and received at least Seven days prior to the meeting date. [hence †] We have scheduled ours to be on September 14th – giving us enough time to fix any gaps, etc.**
- About two weeks following a review panel meeting, an update report with the names of the newly elevated Senior members is published and available for those who hold a volunteer position.

Review panel dates and locations (note: Dates and locations are subject to change without notice.)

Please see Meeting Deadlines (Eastern Standard Time) below for more details.

2024 Meeting Dates	Meeting Deadlines (Eastern Standard Time)
28 September 2024	11:59 p.m. on 21 September 2024
23 November 2024	11:59 p.m. on 16 November 2024

2024 IEEE HQ Panel Meeting Dates

†See our own Section organized event at: https://events.vtools.ieee.org/m/422558 **OR** check the Section web site **OR** see page **XX**

2024 SEM Officers

The IEEE SEM Organizational Roster is Located in the IEEE Southeastern Michigan website at:
http://sites.ieee.org/sem/

Under the TAB titled "About SEM" use the button:
"Organization Roster" to download the PDF version of the current Roster.

(Note: It is also a good idea to download the Organization Org Chart as well in order to get the complete 'big picture' of the Section.)

(Note: To protect the members from getting spam email, the roster is password protected. Request access by sending email to our web master – Scott Lytle.)

Years ago, we used to publish the complete Chart and Roster in the Newsletter. But that was when we had only 5 committees and 9 chapters.

Today we have 16 committees and sub-committees, 18 Technical Chapters, 4 Affinity Groups and 8 Student Branches. The total roster divides into 12 pages with 247 identified officer positions.

That seems like a large organization, and it is, but it also presents our members with many volunteer opportunities to grow their capabilities through the experience of working with leaders who can guide and nurture engineering talent and widen the scope of volunteering through 'hands on' training in those 'soft skills' that can only be mastered by 'doing.'

We often refer to learning the non-technical side of an engineering career as similar to learning to play a musical instrument, or a sport, or how to dance. You can read all the books you want but, you only really learn by doing.

Reading the Roster

Once downloaded notice that the roster is divided into five major segments:

- Executive Committee
- Standing Committees
- Affinity Groups
- Technical Chapters
- Student Branches

Within each segment you should find, at a minimum, the e-mail account for each officer, and in many cases, a work phone and a cell phone for quicker contact.

You may note a number of identified officer roles that have a blank cell (highlighted in yellow) where we would expect an officer name. These are vacant officer positions.

If you notice a vacancy where you might be interested in contributing to fill that role, please contact the relevant 'Chair' in that organization and discuss the duties of the office and consider helping out in that element.

As with all others, the road to this learning begins with the first step. That step is inquiring and finding out what skills go with each position. That information is maintained in the IEEE Center for Leadership Excellence at: **https://ieee-elearning.org/CLE/**

Good luck!

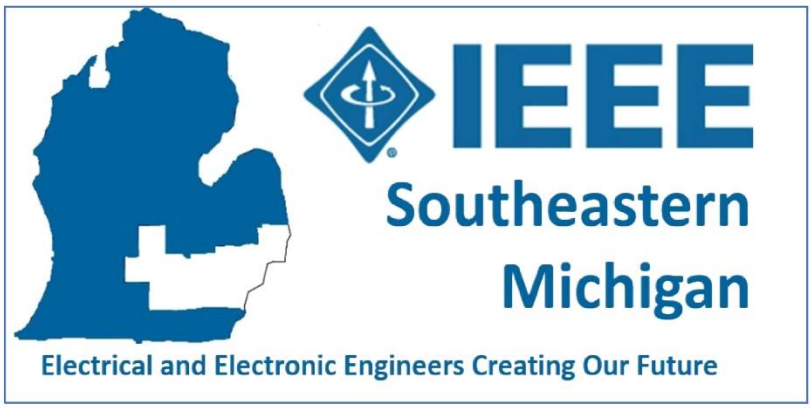
SAVE THE DATE: 140th!

Once in a Lifetime

Celebrating the 140th Anniversary of the IEEE

Afternoon Museum Guided Tour
Cocktail Reception, Section Awards,
IEEE Luminaries Talks, Sumptuous Dinner

3:00 to 8:00 pm
September 21, 2024, (Saturday)
The Wright Museum of African American History
Detroit, Michigan
https://events.vtools.ieee.org/m/422487



The Codebreakers

IEEE Southeastern Michigan
Presents a Video Documentary on
The Codebreakers

IEEE Southeastern Michigan
Electrical and Electronic Engineers Creating Our Future

Based on the book *The Woman Who Smashed Codes: A True Story of Love, Spies, and the Unlikely Heroine Who Outwitted America's Enemies*, The Codebreaker reveals the fascinating story of Elizebeth Smith Friedman, the groundbreaking cryptanalyst whose painstaking work to decode thousands of messages for the U.S. government.

Running time: 55 minutes ()

Quick Summary

- **When:**
  Date: August 9th , 2024
  Time: 1700 – 1800 hrs (EST/EDT)
- **Where:**
  Online via Webex (to be shared only after you have a confirmed registration)
- **Audience: OPEN to ALL***

Sponsored by IEEE Southeastern Michigan Computer Society Technical Chapter

***Pre-Registration Required!**

https://events.vtools.ieee.org/m/413769

IEEE computer society

IEEE Southeastern Michigan Section

RoboFest News

(1) Seeking Part Time Robofest Staff Member
(2) Robofest 2024 Appreciation Dinner Scheduled
(3) One-week Summer Camp for LTU College Credit: C WITH ROBOTS
(4) Introduction to C with Robots Dual Enrollment Class for Fall 2024 Semester
(5) 2025 Season Kickoff and World Championship Dates Announced (Tentative)
(6) Fall UMC Scholarship Competition and Workshop for High School Students

Note: All times are listed in EDT unless noted

(1) Seeking Part Time Robofest Staff Member

The Robofest Office at Lawrence Technological University is searching for a **part-time** Coordinator to join the team. This on-campus staff position has flexible hours (average 5-10 per week) with some evenings and Saturdays. US Citizenship or permanent residency is required. The ideal candidate has Microsoft Office and Google app knowledge, as well as some autonomous robotics experience as a coach or participant. This position is eligible for LTU Educational Assistance Program for the individual and dependents (some restrictions apply). Contact the Robofest Office (robofest@ltu.edu) for more information.

(2) Robofest 2024 Appreciation Dinner Scheduled

Save the Date: Thursday, August 22, 5:30 pm~7:30 pm. We are hosting our Site Host, Volunteer and Coach Appreciation Dinner at LTU in the Computer Science Robotics Lab, Room J234. In addition to dinner, we will have some giveaways, share our wrap-up video and season statistics, and announce plans for the 2025 Robofest season. A RSVP form will be emailed soon. We hope you can join us!

(3) One-week Summer Camp for LTU College Credit: C WITH ROBOTS

Space is still available! July 22-26, 2024, 9:00 am~4:00 pm, Lunch provided
C stands out as one of the most widely used programming languages. This intensive camp course covers essential C programming skills, including variable types, conditional statements, loops, arrays, functions, formatted input/output, file operations, and more. A distinctive feature of this camp is the hands-on application of acquired skills to solve robotics problems. Students will actively engage in writing C code for VEX IQ robots, incorporating various sensor types and actuators. The camp course includes 5+ assignments, a project, a quiz, and a final exam, providing a comprehensive learning experience. LTU's Computer Science bachelor's programs require two MCS1111 coding club classes and this camp will satisfy one of them. To register, go to: https://apply.ltu.edu/register/mcs1111summer24

(4) Introduction to C with Robots Dual Enrollment Class for Fall 2024 Semester

An introduction to C Programming language using VEX IQ Robots is now offered through LTU's Dual Enrollment program for local High School students. The 2-credit class, instructed by Professors Elmer Santos and CJ Chung, runs on Tuesdays from 8:20 am to 10:00 am. Interested students should have completed intermediate algebra/geometry. Contact Professor Santos (esantos@ltu.edu) or the LTU Admissions office (specialadmit@ltu.edu) for more information.

(5) 2025 Season Kickoff and World Championship Dates Announced (Tentative)

The Robofest 2025 Season International Rules will be released on Saturday, **September 28, 2024**. 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 2025.

The kickoff meetings will be held:

Friday, October 4, 2024 9:00am ~ 10:30am (Zoom only)
Thursday, November 7, 2024 7:00pm ~ 8:30pm (Zoom only)
Saturday, January 11, 2025 10:00am ~ 11:30 am (In person and Zoom)

The 26th Robofest World Championship will be hosted on the campus of Lawrence Technological University on **May 15, 16 and 17, 2025**

(6) Fall UMC Scholarship Competition and Workshop for High School Students

Robofest is hosting our second annual Unknown Mission Scholarship Challenge this fall for High School students to compete to win a $17,000 Annual LTU Scholarship. Individual students will be challenged to build and program a robot kit

to solve a task in a limited amount of time. The registration fee is $25. Review the 2024 UMC Rules on the UMC page for the list Robot Kits allowed: https://www.robofest.net/index.php/current-competitions/unknown-mission-challenge

Competition: Sat, Nov 2, 2023, 1:00 PM ~ 5:00 PM
At Lawrence Technological University, Robofest Lab, J234
21000 West 10 Mile Road, Southfield Michigan 48075
Building No. 8 on the LTU campus map: https://www.ltu.edu/about/map Use parking lot E.

A free workshop has been scheduled for registered students to prepare for the competition using VEX IQ robot kits and VEXCodeIQ. Students who attend this optional UMC workshop may borrow a VEX IQ robot kit for the competition on November 2.

Workshop: Sat, Oct 19, 2024, 1:00 PM ~ 5:00 PM
At Lawrence Technological University, Robofest Lab, J234

Registration links for the workshop and competition will be opened on the Robofest registration site after September 1.

Lawrence Technological University / Robofest / J-233 / 21000 W. Ten Mile Rd, Southfield, MI 48075
Prof. Elmer Santos, Director, esantos@ltu.edu
Shannan Palonis, Assistant Director, spalonis@ltu.edu
Pam Sparks, Coordinator, psparks@ltu.edu
Dr. CJ Chung, Professor of Computer Science, Robofest Founder, Executive Council Chair, cchung@ltu.edu
Dr. Chris Cartwright, Associate Professor of Math, Executive Council Member
Dr. Eric Martinson, Chair of Math & Computer Science Dept, Executive Council Member

http://www.robofest.net http://facebook.com/robofest https://www.linkedin.com/company/robofest-official

ELECTIONS ALERT!

To all IEEE SEM Officers at all levels: IEEE Elections 2024 / 2045:

In years past, the Executive Committee, and its Standing Committees of Southeastern Michigan Section have conducted ALL the elections for each of our Geo-units (Chapters, Affinity Groups, and the primary Section Executive Committee officers). **This year**, according to the instructions in the MGA Policy and Procedures (P&P) Manual 2024, each Geo-unit is directed to setup its own election committee, nominate its own officer candidates and conduct its own elections.

See the complete instructions in the P&P Manual at:
https://mga.ieee.org/images/files/Current_MGA_Operations_Manual_2024__22_June.pdf
In Section **9.13**. Search for "**GEOGRAPHIC UNIT ELECTIONS**" starting on Page 126.
Other information is available at:
https://mga.ieee.org/volunteer-hub/geographic-unit-operations/geographic-unit-elections

Training **Sessions were held on July 15th!**
Topics Covered:

- In depth Section use of the new Nominations/Elections Tool
- Recap of first training:
  - Elections process overview
  - Highlighting available resources
  - FAQ
- Reminder: Elections to start by 15 August
- Q&A session

Who Should Review: These training sessions are designed for Geographic Unit Officers and Elections (previously Nominating) Committee members working on elections for their Geographic Units. Officers are asked to forward this invitation to their respective Elections (previously Nominating) Committee members.

Transmission Planning

Transmission Planning for Renewable Energy and Load Growth

Abstract:
Recent federal legislative and regulatory action along changing resource mixes are causing rapid shifts in how our energy system is being utilized. Two pieces of Federal legislation, the CHIPS act and the Inflation Reduction Act (IRA) are driving an increase in domestic manufacturing leading to load growth and increased renewable energy demand. Additionally, the Federal Energy Regulatory Commission passed two groundbreaking rules. The first, Order 2023, changes the way that generation is processed by interconnecting utilities. The second, Order 1920, moves transmission planning towards a more proactive and holistic construct. During this talk we will talk about how this all fits to together and what regulatory barriers still exist preventing us from fully building the transmission grid that we need at the lowest possible cost.

Speaker: David Mindham

DAVID MINDHAM is presently Associate VP, Regulatory & Market Affairs for EDP Renewables. In that role, he oversees a team that develops and implements transmission and market strategy in multiple jurisdictions across North America. He is active in several RTO stakeholder forums, including chair of the MISO Interconnection Process Working Group, a member of the SPP Strategic Planning and Members Committees, and a member of the ERCOT Protocol Revisions Subcommittee. He serves on the Board of Directors of Americans for a Clean Energy Grid, IEEE-USA, Clean Grid Alliance, and Southern Renewable Energy Association. Before his current role, he has held positions in RTO strategy, FERC strategy, and transmission planning at ITC Holdings Corp.

Agenda:
1. Socializing and Dinner (6:00 pm-6:30pm)
2. Presentation followed by Q&A

Where: Rose's Restaurant & Lounge, 201 N Canton Center Rd, Canton, MI 48187
PDHs: One Hour (with request)
When: Wednesday, July 10, 6:00 – 8:00 P.M.
Price: Free (with Dinner)
Registration link: https://events.vtools.ieee.org/m/424851

Student Branch News

Noise Injection Attacks Against the Steering Actuator Commands of Mobile Robots and Autonomous Vehicles

Alireza Mohammadi[1], Hafiz Malik[1], and Chance Ashworth[1]

Abstract

Motivated by recent successful cyberphysical attacks against robotic vehicles, which aim at creating deviation in the nominal path of these platforms, this paper investigates the effectiveness of additive noise injection into the steering actuator commands of mobile robots and autonomous vehicles. After presenting the theoretical motivation and our experimental testbed, we present preliminary experiments demonstrating the effectiveness of such noise-based attack policies targeted towards the steering dynamics of autonomous wheeled mobile platforms.

INTRODUCTION

Attackers through sophisticated means, which range from acoustic noise-based spoofing of gyroscopic sensors and MEMS accelerometers to injection of tampering magnetic fields for corrupting the readings of ABS sensors, have managed to launch successful cyberphysical attacks against drones, autonomous robots, and automobiles (see, e.g., [1]–[4]).

One potential adversarial objective in attacks against autonomous vehicles and wheeled mobile robots is to create deviation in the mobile platform trajectory from its nominal path. For instance, the celebrated hacks by Miller and Valasek (see, e.g., [5]) resulted in steering a 2014 Jeep Cherokee into a ditch in a scentless manner while leaving almost no forensic evidence behind.

Other means such as spoofing Global Navigation Satellite System (GNSS) sensor readings and robotic vehicle control inputs [6] as well as wheel lock attacks against autonomous and connected vehicles [7], [8] have also been utilized to create trajectory perturbations.

This paper, motivated by the line of work on creating deviations in the nominal path of autonomous mobile platforms (see, e.g., [5]–[8]), investigates the effectiveness of additive noise injection into the steering actuator commands of mobile robots and autonomous vehicles. After presenting the theoretical motivation behind this work and our testbed, we present the preliminary experimental results demonstrating the effectiveness of such noise-based steering attack policies against autonomous mobile platforms.

[1] A. Mohammadi, H. Malik, and C. Ashworth are with the Department of Electrical and Computer Engineering, University of Michigan-Dearborn, MI 48127 USA. Emails: {amohmmad,hmalik,chancea}@umich.edu. Corresponding Author: A. Mohammadi.

The rest of this paper is organized as follows. After presenting the theoretical justification and some background on the effect of noise perturbations on the behavior of dynamical systems in Section II, we present our experimental testbed and preliminary results in Section III. This paper concludes with future research directions and final remarks in Section IV.

THE IMPACT OF NOISE PERTURBATIONS ON THE STABILITY OF DYNAMICAL SYSTEMS

In this section we provide the theoretical justification and some background material on the destructive effect of noise on the stability of dynamical systems. Indeed, there is a rich body of literature demonstrating that properly designed noise perturbations, such as Brownian motions, can destabilize the equilibria of dynamical systems, which would have been stable otherwise (see, e.g., [9] and the references therein). For instance, Hutt has shown that additive colored noise sources (i.e., noise sources with finite correlation times) can potentially alter the system stability [10]. Therefore, there is a need to assess the impact of noise injection attacks into the steering commands of autonomous mobile platforms.

In this paper we assume that the adversary's objective is to create deviation in the nominal path of his/her targeted mobile platform by means of injecting noise perturbations into its steering commands. Our assumption is that the adversary has the capability of injecting such noise perturbations into the steering control inputs after a successful infiltration into the steering actuator control system and corrupting the control program binary of the steering system (e.g., through the EEPROM and Flash memory of a wheeled mobile robot or a steering-related ECU of an autonomous vehicle [5], [11]).

A relevant theoretical framework for assessing the impact of steering noise-based attacks can be found in the pioneering work of Demir, Kartner, and collaborators in the context of circuit

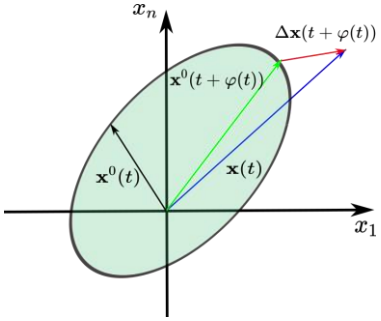


Fig. 1: The noise perturbation inputs create tangential and transversal deviations from the nominally planned response of a given dynamical system. In particular, a dynamical system response $\mathbf{x}(t)$ to random noise inputs can be written as the sum of a tangential perturbation of the nominal response, i.e., $\mathbf{x}^0(t+\varphi(t))$, where $\varphi(\cdot)$ is a random phase perturbation, and a random transversal perturbation, i.e., $\Delta\mathbf{x}(t+\varphi(t))$, which captures orbital deviations from the planned system trajectory.

theory (see, e.g., [12]–[14]). In particular, let us consider the following dynamical system under an adversarial noise perturbation

$$\mathbf{x}^{\cdot} = \mathbf{f}(\mathbf{x}) + \mathbf{G}(\mathbf{x})\mathbf{b}(t), \qquad (1)$$

where $\mathbf{x} \in R^n$ is the state of the dynamical system and $\mathbf{G}(\mathbf{x})\mathbf{b}(t)$ is a state-dependent perturbation, in which $\mathbf{b}(t)$ is a random noise input generated by the adversary. For instance, the so-called bicycle model, which has been utilized for design of active steering control systems (see, e.g., [15]), has a similar structure to the system given by (1).

We assume that the unperturbed dynamical system in (1) (i.e., when $\mathbf{b}(t) = \mathbf{0}$) is performing a desired periodic task (corresponding to a periodic orbit $\mathbf{x}^0(t)$) or has converged to a desired path by making the path following cross-track error equal to zero. As an example of a periodic task, one can think of a mobile robot moving along the production lines of a manufacturing setting and supplying parts for machine feeders in the factory [16].

The response of the dynamical system in (1) under adversarial noise perturbations can be shown to satisfy (see, e.g., [12] for further details)

$$\mathbf{x}(t) = \mathbf{x}^0\big(t + \varphi(t)\big) + \Delta\mathbf{x}(t + \varphi(t)), \tag{2}$$

where $\varphi(\cdot)$ and $\Delta\mathbf{x}(\cdot)$ represent the noise-induced random phase and random orbital deviations from the nominal path, respectively (see, also, Figure 1).

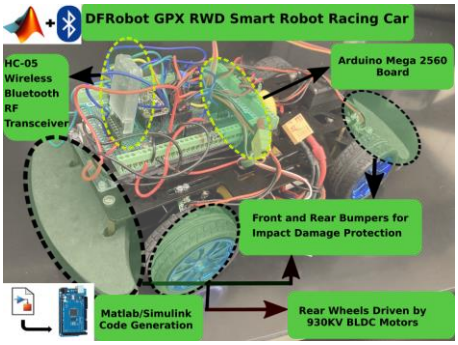


Fig. 2: The experimental platform for testing noise injection attacks into steering actuator commands of wheeled mobile robots and autonomous vehicles. The Arduino Mega 2560 microcontroller can be remotely programmed using the automatic code generation features of Matlab®/Simulink® and the HC-05 wireless bluetooth module onboard the DFRobot Car.

As demonstrated by Demir *et al.* [13], [14], when the perturbation vector $\mathbf{b}(t)$ in (1) consists of white noise sources that are uncorrelated, it can be shown that the variances of the entries of the deviated component $\Delta\mathbf{x}(t+\varphi(t))$ can grow unbounded. Therefore, the growth in deviation under random noise inputs is completely unlike when $\mathbf{b}(t)$ is a bounded known deterministic signal, which can only cause a small deviation from the nominal operating conditions. Furthermore, the random phase deviation $\varphi(\cdot)$ gives rise to undesired jitter in clocked and sampled-data systems, which can in turn cause switching uncertainties and synchronization issues (see [14] for further details).

PRELIMINARY EXPERIMENTAL RESULTS

Our experimental platform is based on DFRobot GPX RWD Smart Robot Racing Car (see Figure 2), whose chassis is constructed with aluminium-alloy material. The platform is equipped with two DC motors that are controlled using brushed electronic speed controllers (ESC). The front steering knuckle of the platform, which is designed with spring suspension, enables it to perform a wider range of steering maneuvers. The front and the rear bumpers, which aim at securing it from impact damages, make it very suitable for testing various cyberphysical attacks against the vehicle.

The Arduino Mega 2560 microcontroller can be remotely programmed using the automatic code generation features of Matlab®/Simulink® and the HC-05 wireless bluetooth module onboard the DFRobot Car, which is an RF transceiver for serial communications with Matlab.

To test the effectiveness of noise injection into the steering actuator commands of our experimental platform, we applied the steering command

$$\delta_f = \delta_f^n + \delta_f^a(t), \tag{3}$$

where the input δ_f^n is the nominal steering control input for following a straight line (see, e.g., [17]) and $\delta_f^a(t)$ is an injected noise input (in the experiments, Brownian noise).

To generate the sequence of Brownian noise inputs $\delta_f^a(kT)$ in real-time, where k is a non-negative integer and T is the sampling period, we utilized the well-established techniques in the literature for generating digital sequences of fractal Brownian motion by utilizing a waveletbased synthesis method [18] (see, also the the

numerical routines in the work by Xu [19], who provides fast numerical algorithms for generation of colored noise using a fractional differencing procedure).

The experimental results of one test are depicted in Figure 3. The blue line corresponds to the nominal straight line that the robot would follow in the absence of Brownian noise steering attack input. The injected fractal Brownian motion into the steering actuator commands has a Hurst parameter value equal to 0.98. As expected from our preliminary theoretical analysis in Section II, the mobile platform leaves its nominal path, whereas in the absence of such adversarial noise injection the mobile platform would have moved on the blue straight line.

CONCLUSION

In this paper we investigated the effectiveness of adversarial additive noise injection into the steering actuator commands of wheeled mobile robots and autonomous vehicles. The preliminary experimental results were in accordance with the theoretical predictions afforded by the pioneering literature on noise-induced response of oscillators in circuit theory. Our future research will investigate the possibility of injecting such noise steering inputs through GNSS spoofing, desynchronizing the motion of industrial mobile robots in a manufacturing setting by means of jitter induction in their steering dynamics, and extending our work to non-wheeled mobile robotic systems such as UAVs.

ACKNOWLEDGMENT

This work is supported by NSF Award CNS–2035770.

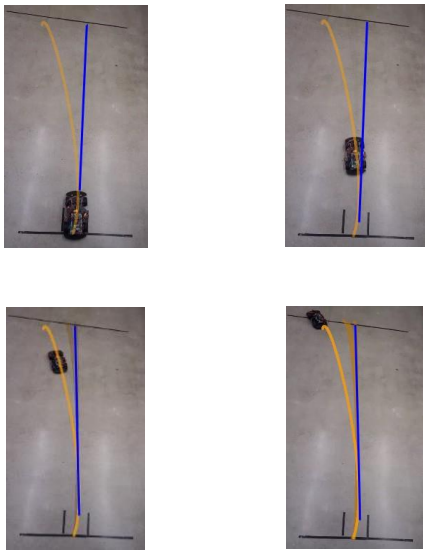


Fig. 3: Snapshots of the preliminary experimental results associated with injection of Brownian noise into the steering actuator commands. The blue line corresponds to the nominal straight line that the robot would follow in the absence of Brownian noise steering attack input.

REFERENCES

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Evolution of ADAS

Evolution of Autonomous Drive Assistance Systems (ADAS):

The invention of the car wasn't a single "aha!" moment, but rather the culmination of ideas and advancements over time. Here are some key reasons why people were driven to invent cars:

•**Increased Mobility:** Horses and carriages were the primary means of transportation for centuries. Cars offered a faster, more weather-resistant, and ultimately less labor-intensive way to travel. People could move goods and themselves over longer distances with greater ease.

•**Industrial Revolution:** The Industrial Revolution created a demand for faster and more efficient transportation of people and materials. Cars facilitated the growth of factories, businesses, and trade networks across wider territories.

•**Personal Freedom:** Cars offered individuals and families a newfound sense of freedom and exploration. They weren't reliant on public transportation schedules or limited by the range of horse-drawn carriages.

•**Military Applications:** Early automobiles were quickly adopted for military use. Their speed and maneuverability offered advantages over traditional horse-drawn cavalry units.

•**Evolution of Technology:** The invention of the internal combustion engine was a major breakthrough, enabling the development of practical and commercially viable automobiles. Advancements in materials science and engineering further fueled car development.

These factors, combined with a spirit of innovation and human desire for progress, led to the invention of the car. While the initial focus was on practicality and utility, cars eventually became a symbol of personal freedom, status, and technological advancement. The need for ADAS (Advanced Driver-Assistance Systems) and connected vehicles arose from a convergence of several factors aimed at improving safety, efficiency, and the overall driving experience. Here's a breakdown of the key reasons:

Safety Enhancement:
•**Reducing Human Error:** Traffic accidents are overwhelmingly caused by human error (distraction, fatigue, misjudgment). ADAS features like lane departure warning, automatic emergency braking, and blind spot detection can intervene and prevent accidents or mitigate their severity.
•**Improved Situational Awareness:** Connected vehicles can share data about traffic conditions, hazards, and road closures, providing drivers with a more comprehensive picture of their surroundings and allowing them to make better decisions.

Efficiency and Convenience:
•**Traffic Optimization:** Connected vehicles can communicate with traffic management systems to optimize traffic flow, reducing congestion and travel times.
•**Automated Features:** ADAS features like adaptive cruise control and lane centering can automate some driving tasks, reducing driver fatigue and stress on long journeys.
•**Real-Time Information:** Connected vehicles can access real-time information like weather updates, parking availability, and nearby points of interest, enhancing the driving experience.

Future of Autonomous Vehicles:
•**Paving the Way for Self-Driving Cars:** ADAS features serve as building blocks for the development of fully autonomous vehicles. The technologies and functionalities tested and refined in ADAS systems can be further advanced for self-driving cars.
•**Infrastructure Preparation:** Connected vehicle technology allows for communication between vehicles and infrastructure (V2X communication). This is crucial for establishing a network for future autonomous vehicles to interact with their environment.

Examples of ADAS features in vehicles on streets today
Tesla Autopilot FSD (Full Self-Driving)
•**Functionality:** Tesla's Autopilot FSD (Full Self-Driving) is a driver-assistance system, not a fully autonomous driving solution. It offers features like:
•Automatic lane centering and steering on highways

•Traffic light and stop sign recognition (with driver confirmation required for stopping)
•Autosteer on city streets (still under development and requires significant driver supervision)
•Navigate on Autopilot (automatic lane changes and highway interchanges with driver supervision)
•Summon and Smart Summon (allows remote control of the car for parking maneuvers in close proximity, with driver supervision required by law)
•**Technology:** Tesla relies primarily on a camera-only vision system for its Autopilot FSD. They do not use LiDAR or radar sensors.
•**Availability:** FSD is available as an add-on purchase for compatible Tesla models. It requires a driver to be present and attentive at all times, ready to take control of the vehicle. If the steering is not held at all times, there is a blue light flash on the screen and eventually the car would goto side and hault.

Waymo Driver
•**Functionality:** Waymo Driver is a fully autonomous ride-hailing service currently operating in limited geographic areas (e.g., Phoenix, Arizona). Passengers can request a self-driving Waymo car through their app.
•**Technology:** Waymo uses a suite of sensors including LiDAR, radar, and cameras to create a detailed 3D perception of the environment. This allows Waymo vehicles to operate in various weather conditions and navigate complex urban environments. The sensors give better object detection and thus make the software suitable both for urban driving and freeway setup.
•**Availability:** Waymo Driver is not yet widely available for public use. It is currently limited to specific regions and operates within a defined operational design domain (ODD).

Cruise Origin
•**Functionality:** Similar to Waymo, Cruise offers a fully autonomous ride-hailing service (Cruise Origin) in limited areas (e.g., Phoenix). Passengers can hail a self-driving Cruise vehicle through their app.
•**Technology:** Cruise uses a combination of LiDAR, radar, and high-resolution cameras to perceive its surroundings. Detailed mapping also plays a role in Cruise's self-driving system.
•**Availability:** Cruise Origin's availability is currently limited to specific geographic areas and operates within a defined ODD. It is not yet widely available for public use.

Key Differences:
•**Level of Autonomy:** Tesla's Autopilot FSD is a driver-assistance system, while Waymo Driver and Cruise Origin are fully autonomous ride-hailing services (with limitations based on operational areas).
•**Sensor Technology:** Tesla uses cameras only, while Waymo and Cruise utilize LiDAR, radar, and cameras for a more comprehensive perception system.
•**Availability:** Tesla's Autopilot FSD is more widely available as an add-on feature, whereas Waymo Driver and Cruise Origin are limited to specific regions as ride-hailing services.

Self-driving technology is still under development. All these systems have limitations and require ongoing testing and refinement. It's crucial to stay informed about the specific features and limitations of each system, and always follow the safety guidelines provided by the manufacturers.

Autonomous Trucking:
There is going to be a shortage of 160,000 drivers by 2030 in the USA.
Here's a summary of the self-driving features offered by Torc, Kodiak, and Aurora Trucks, all focusing on autonomous trucking applications:

Torc:
•**Focus:** Acquired by Daimler Truck in 2019, Torc is developing a self-driving system specifically for long-haul trucks on highways.
•**Functionality:** Information on specific features is limited, but Torc is likely to focus on:
•Autonomous lane centering and steering on highways
•Automatic lane changes (with potential for human oversight)
•Traffic jam assist and automatic emergency braking
•Platooning capabilities (allowing multiple self-driving trucks to travel close together for fuel efficiency)
•**Technology:** Daimler Truck has stated their intention to integrate Aeva's advanced LiDAR technology into Torc's self-driving trucks for enhanced object detection. Additional sensor details are not publicly available.
•**Availability:** Torc's self-driving technology is still under development and not yet commercially available. They aim for commercial launch by 2027.

Kodiak:
•**Focus:** Kodiak offers autonomous trucking services for specific routes and hubs, currently focusing on long-haul transportation between major cities in the United States.
•**Functionality:** Kodiak's self-driving trucks operate on pre-mapped routes within their defined Operational Design Domain (ODD). Features might include:
•Autonomous lane centering and steering on highways
•Automatic lane changes within the ODD (potentially with remote human oversight)
•Geofencing and automatic stopping at designated pick-up and drop-off locations
•**Technology:** Kodiak utilizes a combination of sensors, likely including LiDAR, radar, and cameras, to perceive the environment. Detailed high-definition maps also play a crucial role in their self-driving system.
•**Availability:** Kodiak currently operates a limited fleet of self-driving trucks on specific routes. Their services are not yet widely available, but they are making progress in expanding their network.

Aurora Trucks:
•**Focus:** Similar to Kodiak, Aurora Trucks offers autonomous trucking services on pre-mapped routes, currently focusing on long-haul transportation between major cities in the United States. Partnered with Continental
•**Functionality:** Specific features are not publicly disclosed, but Aurora Trucks likely focuses on functionalities similar to Kodiak, including:
•Autonomous lane centering and steering on highways
•Pre-approved automatic lane changes within the ODD
•Geofencing and automatic stopping at designated locations
•**Technology:** Aurora uses a suite of sensors, including LiDAR, radar, and cameras, to create a 3D perception of the environment. Detailed mapping is also integrated into their self-driving system.
•**Availability:** Aurora Trucks' self-driving trucking service is currently limited to specific routes and locations. They are actively developing and testing their technology with plans for future expansion.

Key Similarities:
•All three companies (Torc, Kodiak, and Aurora Trucks) are focused on self-driving technology for long-haul trucking applications on highways.
•Their functionalities likely involve autonomous lane control, automatic lane changes (with limitations), and geofencing for designated stops.
•All three utilize a combination of sensors (likely including LiDAR, radar, and cameras) for perception and rely on high-definition maps within their operational design domains.

Key Differences:
•**Availability:** Kodiak currently has a limited operational trucking service, while Torc and Aurora are still in the development phase.
•**Level of Detail:** Information on Torc's specific features is limited due to their recent acquisition by Daimler Truck.
•**Focus:** There might be subtle differences in the specific functionalities offered by each company as their technologies mature.
Important Note:
The development of self-driving trucks is an ongoing process. These companies are constantly refining their technologies, and specific functionalities and availability can change. Always refer to official sources for the latest information.

Self-Driving Features of Ford, GM, and Stellantis
Here's a breakdown of the self-driving features currently offered (or planned) by Ford, GM, and Stellantis:

Ford:
•**Ford BlueCruise:** This is Ford's current hands-free highway driving system. It uses a combination of cameras and radar to keep the vehicle centered in its lane on highways with clear lane markings. However, it's important to note that BlueCruise requires driver supervision and drivers must be ready to take control of the vehicle at a moment's notice. It's available on select Ford models like the Mustang Mach-E and F-150.
•**Future Developments:** Ford is investing heavily in autonomous vehicle technology and plans to develop more advanced self-driving features in the future. However, there's no concrete information on specific functionalities or timelines yet.

GM:
•**Super Cruise:** This is GM's hands-free driver-assistance system for compatible Cadillac models on specific pre-mapped highways. It utilizes LiDAR, radar, and cameras for a more comprehensive view of the surroundings compared to camera-based systems. Similar to BlueCruise, Super Cruise requires driver attention and supervision.

•**GM Cruise:** This is a separate division of GM focused on developing fully autonomous vehicles for ride-hailing services. They are currently testing self-driving vehicles in San Francisco and other cities. However, these are not features available in consumer-owned vehicles yet.

•**Stellantis (Peugeot, Citroën, DS, Fiat, Chrysler, Jeep, Dodge, RAM, Alfa Romeo, Maserati):**
Stellantis has limited features currently. Stellantis brands like Chrysler and Jeep offer some driver-assistance features like adaptive cruise control and lane departure warning. However, they don't have any hands-free highway driving features like Ford's BlueCruise or GM's Super Cruise yet.
Stellantis has announced partnerships with companies like Waymo for developing self-driving technology. However, specific details and timelines for consumer-available features haven't been announced yet.

All the features mentioned above are driver-assistance systems and require driver supervision. They are not fully autonomous vehicles that can operate without human input. The availability and functionalities of these features might vary depending on the specific vehicle model and trim level. Regulatory hurdles and safety concerns are still major factors influencing the development and deployment of fully autonomous vehicles.

Ford and GM currently offer highway driving assistance features with some level of automation, while Stellantis is still in the early stages of development. All three companies are likely to continue investing in self-driving technology, but it might take some time before fully autonomous vehicles become a widespread reality.

FUSA (Functional Safety):
•**Focus:** FUSA emphasizes ensuring the safe operation of the AV even when malfunctions occur within its electrical and electronic systems. It aims to minimize the risk of accidents caused by hardware or software failures.
•**How it Works:** FUSA involves a rigorous development process with risk assessments, fault tolerance mechanisms, and redundancy in critical systems. This ensures that even if a single component fails, the AV can still operate safely or gracefully degrade its functionality.
•**Example:** Imagine a sensor malfunction. FUSA might involve having redundant sensors or a system that can detect and compensate for the faulty sensor data to maintain safe operation.

SoTIF (Safety of the Intended Functionality):
•**Focus:** SoTIF addresses the safety of the AV's intended behavior. It ensures that the AV's perception, planning, and control systems operate as designed and can handle the driving situations they are intended for within their Operational Design Domain (ODD).
•**How it Works:** SoTIF involves verifying and validating the AV's performance under various conditions through simulations, test tracks, and real-world testing. It focuses on how well the AV perceives its surroundings, makes decisions, and controls the vehicle within its limitations.
•**Example:** SoTIF testing might involve evaluating the AV's ability to handle unexpected situations like pedestrians entering the road or navigating through heavy rain that might impact sensor performance.

Why Both are Important:
•**Combined Approach:** FUSA and SoTIF work together to ensure a comprehensive safety strategy for AVs. FUSA safeguards against system malfunctions, while SoTIF ensures the AV's intended behavior itself is safe within its operational boundaries.
•**Mitigating Risks:** Both approaches help to minimize the risk of accidents due to unexpected situations or limitations in the AV's capabilities.
•**Building Trust:** FUSA and SoTIF contribute to building public trust in the safety and reliability of autonomous vehicles.

Summary:
•ADAS is an ever-evolving technology and it varies based on the usecase.
•Safety is critical and it is challenging to achieve 100% validation.
•System On Chip Designs will play a critical role in providing the computing power necessary for self driving capabilities
•GenAI capabilities in model building for mobile vehicles yet to be explored.
•Increased cost with add on features , cybersecurity requirements and government regulations are huge challenges posed to the Industry today.

Sneha Shetiya
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VTS Officer Profile

From Trucking to Automobile: Sneha shares her incredible experiences from the Industry.

Sneha Sudhir Shetiya is an active IEEE member and current Treasurer for SEM IEEE VTS Society Chapter. She has worked in the Auto Industry for 8+ years till date with a Masters in Computer Vision and Signal Processing from North Carolina State University, Raleigh, NC, USA. Sneha graduated in May 2021. Prior to her Masters, she worked for about 5 + years in Mercedes Benz Research and Development India where she contributed to the networking and diagnostics aspects of Automotive and aided in building the Actros models for Daimler Trucks , Germany. Here she touched upon all the aspects of the V-cycle from requirements specification to testing and was a major contributor to software deliverables for major motor control and aftertreatment ECUs(Electronic Control Units).

After her Masters, having gained insights in Autonomous Driver Assistance Systems through real world Projects using Neural networks and other ML(Machine Learning) topics, Sneha transitioned to work on specifically self-driving vehicles. She worked day and night on assembly of critical demo vehicles as part of the prestigious Avante project at Qualcomm Technologies Inc. and took part representing Qualcomm at CES 2022. Here is picture of the team at work :

Sneha is not only a champion of the technology but also actively participates in activities outside work for safety regulation of the ADAS software by being part of various IEEE and SAE standards. She took part in IEEE CVD 2024 and met various senators of Michigan in Washington DC and put forward the cause to get the ADAS software technology in the Automobile companies of Michigan and get them on par as in California. Here is an image with Senator Hailey Stevens in her office.

Sneha is a huge pioneer of Women in Engineering and has recorded a podcast with Mouser Electronics stressing the importance of having women in leadership and engineering and also is career mentorship lead driving mentorship programme as part of Women in Automotive Technology. Its great to have Sneha part of the Southeastern Michigan section where we hope to drive many activities in collaboration with other non-profits like Women in Robotics.

Showing Up.

I recently stumbled upon this article which I had written back in 2011 when I was the SEM Section Chair and was struck the situation in this article still maintained a concern today! Had we made no progress in this area at all?
Then I wondered about our political system, and how many of our elected officials seem to believe that their 'office' should be theirs 'by right' and once elected, they just seem to feel that all they need to do is 'warm the seat' in which they sit. (We have some Geo-unit officers who don't show up for Section meetings….ever!)

A few months ago, I attended a lecture on training new employees for general employment and was startled when the first topic on the list was showing up for work, on time and ready to go. For anyone educated in the USA school system, where regular attendance is the norm, the thought that someone new to a job had to be reminded of this simple fact was a revelation.

Of course we need to be there. If we are not, everything after that is not going to happen. At least it is not going to happen to me, and if I keep that up, I won't be asked to come back. In fact, I may be forcefully asked NOT to come back!

Any organization cannot run effectively if some of the people who said they 'wanted to do the work' consistently fail to show up. It is no different with a volunteer organization like the IEEE. If someone volunteers to perform some function or lead some activity and they do not show up, the function or activity is in jeopardy.

Universities don't hire extra professors to cover some who decide that 'This is a nice day, so I'll just wander in the park today'. Industries don't hire multiple workers to do the same assembly line job assuming that one or more is not going to show up for work. The IEEE doesn't elect multiple officers or appoint multiple directors in the assumption that one or more will just decide that 'today I don't have time for that'. There are no extra hands to pick up the work and carry on when someone decides that their promise to be present and help is non-binding and that someone else must do that instead.

No-no one else will do it. The project will fail. The activity will stall.
The progress that might have been accomplished will crash and burn!

IEEE SEM ExCom Teleconferences:
Everyone is working toward the success of IEEE and of our Section. Your active and consistent participation is needed and necessary to the accomplishment of our goals. We need you to do your part. That can only happen when you 'show up'.

Each month, on the 2nd Thursday of the month at 6:30 PM the Section holds its monthly administrative teleconference. We made this a teleconference (or combined face-to-face and teleconference) so that it would be easy for people to attend. No one must drive to the meeting. No gas is used. No wear on the tires. Only time is required. Attendance at the ExCom meetings can be by either the Chair and/or any (or all) of the co-officers (Such as the Vice-Chair, Secretary or Treasurer). Note: Geo-units include all standing committees, affinity groups, student branches, technical chapters and HKN chapters. Individual members are also welcome to attend and lend their voices in an open, democratic process.

We also ask that each operating element; Section Officer or Director, Chapter or affiliate group send in a monthly written (e-mail) or fill the on-line file with a status update, so we know:

- Everything is OK, and
- You are planning and working toward success of your element, and
- If you need help or funding for special projects, we have a 'heads up'.
- Anything that might be drifting 'off into the weeds' can be caught and addressed.

The reports don't have to be long epistles, and many Chapters structure their reports so that the same basic report, with minor 'tweaks' each month serves to keep us all up to speed on their operation.

Our Section Secretary compiles all the reports together and publishes them before each teleconference so that all Section elements have a chance to catch up with everything that is going on in the Section before the teleconference begins. As a result, when we hold the teleconference, we don't have to "read" our reports into the record…they are already there. We also then have sufficient time to discuss any problems or concerns that need detailed explanation and or discussion and debate. If a vote is needed, we can do it then, and approve an action (such as a funding request) that same day.

All in all, the system is working quite well for those who show up. There lies the problem. Some elements do not show up. (By that I mean that a few Chapters have officers that never take the time required log into the internet site, or to dial the teleconference phone number, or write a short report and send it in.)

Don't misunderstand. Most of our Section Officers are regular contributors and help and assist at every turn. (In fact, some actively 'cover' for some other Officers who neglect their responsibilities on a regular basis.) The work of the Section is moving forward. We are making progress. How much more we could accomplish if most of the Officers participated in most meetings.

Face-2-Face ExCom Meetings:
Section Face-2-Face meetings are designed to allow us to 'network' with each other, enjoy each other's company, and discuss Section level issues of importance without having to deal with all the administrative 'stuff' at the same time. This schedule (Monthly administrative teleconferences and quarterly non-administrative face-2-face discussion meetings) is designed to address one of the long term complaints about Executive Committee (ExCom) meetings: "We never have time to talk about what is important." Well, now we do!

Our next Section virtual ExCom meeting takes place on Thursday August 8th, and the next 'Hybrid' (Both face-to-fac and 'virtual') will be on September 12 with registration at 5PM, dinner provided, and the working business meeting to begin at 5:30PM.

We look forward to seeing you there. **Please 'show up'.**

Kimball Williams
Section IMC
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Why Don't They…?

How many times have you been sitting at your desk wondering, "Why won't they _____ ?" Perplexed, you talk with your buddy at work. The conversation goes something like, "I've got this person, and I can't figure out why they won't _____." Or perhaps you talked directly to the person, but after several conversations, they still haven't done what you asked them to do. There are four reasons why people don't do what you ask them to do:

1. They don't know how.
2. They don't think they know how.
3. They can't.
4. They don't want to.

Reason number one for a lack of employee performance, they don't know-how, is the easiest to solve. People who don't know how to do something need training, coaching, a mentor, a job aid, or some other form of instruction. The hope is that with the right training and exposure, they will be able to do what you're asking.

Reason number two for a lack of employee performance, they don't think they know how, can be improved over time with patience and consistent coaching. You aren't working with clean slates. Most people are recovering from or reacting to a past relationship or situation. If a person worked for a controlling manager who never let them make a decision or worked for someone who invoked punitive consequences for making mistakes, the person will likely be hesitant to make decisions. Hence why they continue to ask questions and repeatedly check in, but never make a decision independently.

If you work with someone who doesn't think they know what to do, but you know they have the answer, encourage them to trust themself. When they come to you for validation or approval, ask questions, don't give answers. Tell the person you trust their judgment and encourage risk-taking. Tell them you'll support their decision, even if it proves to be the wrong one. And encourage them to make a decision next time without consulting you. Then keep your word. If they make a wrong call, you have to have their back and can't invoke negative consequences.

Reason number three for a lack of employee performance, they can't, is challenging but clear cut. People who can't do a task their brains aren't wired for, will never do that responsibility well, regardless of how much coaching, training, and assistance you provide. If you have repeatedly and effectively, coached, trained, and provided support and the person still can't do what is being asked, remove that responsibility and give the person something they can do well. If that responsibility is a large part of the job, you have someone in the wrong job. It's time to make a change.

Reason number four for a lack of employee performance, they don't want to, is annoying but manageable. There are lots of reasons people don't do things they don't want to do. Those reasons include, but aren't limited to, boredom, lack of buy-in as to why something is important, insufficient time, feeling like a task is beneath them, etc. If you've got someone who can but doesn't want to do something, you can either take the responsibility away, incent them to do it, or give feedback EVERY TIME the task doesn't get done.

Giving negative feedback isn't fun for the giver or the receiver. No one wants to hear that they aren't meeting expectations, and most people don't want to tell you. But the discomfort of receiving negative feedback EVERY TIME the person doesn't do what they need to do will create behavior change. They will either begin doing what you ask, quit, or ask for a transfer. Either way, your problem is solved.

The first step in getting people to do what you want them to do is to discover why they're not doing what you ask. It's impossible to appropriately manage employee performance if you don't know why someone isn't doing what needs to do be done. And the person to ask why a responsibility isn't getting done isn't you or your buddy, it's the person not doing the work. So, get out of your head, leave your office or laptop, and go talk to the person not doing the work.

Here's how to start an employee performance conversation:
"I've noticed you're not doing _____. Help me understand what's happening." Watch your tone, inquire from a place of genuine curiosity, and identify the reason they aren't doing what they need to do. Then you can intervene appropriately and hopefully get the behavior you want.

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.

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
Chapter: 18 (CH04162)	(MAG33)	Magnetics Society

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

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!

[NOTE – the Student Branch Chapters of several Societies has been eliminated, due to several years of non-activity as well as there is no one left, who started it years ago!]

Curated & Maintained By
Sharan Kalwani,
Chair, IEEE Southeastern Michigan Section (2022-2024)
Editor, Wavelengths (*Serving you as an active newsletter contributor since 2018)*
Enthusiastic IEEE volunteer since 2011

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

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 academic year:
https://mipse.umich.edu/seminars.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://2022.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 Executive Committee is the primary coordination unit for Southeastern Michigan (SEM) IEEE operations. The basic organization chart below shows the 2023 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.

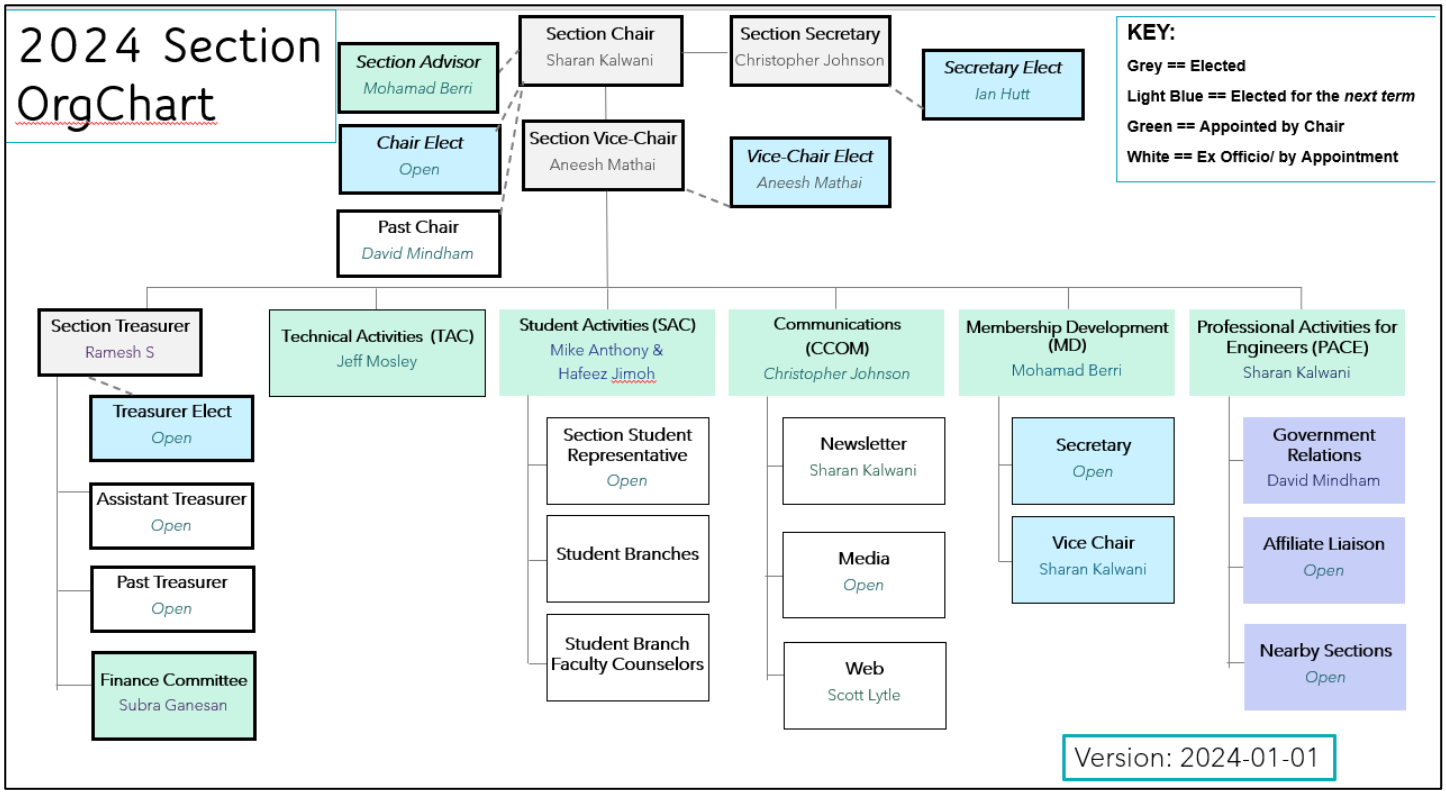
However, members of the section may have multiple technical interests and would like to have meeting information of other chapters. In order to communicate the meeting dates of all the chapters, affinity groups etc., to our members to facilitate their attendance, leaders of the groups are requested to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

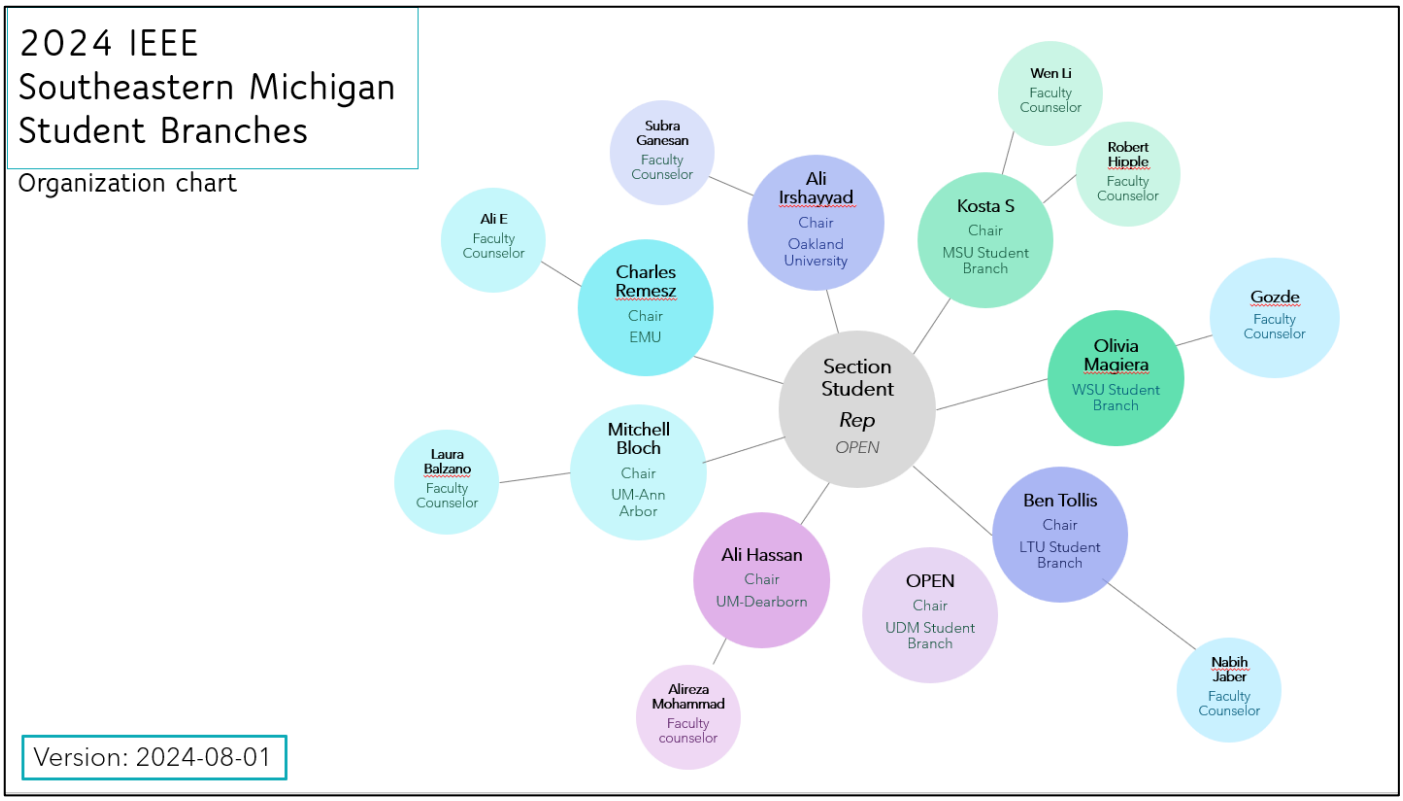
More detailed information on meetings may be found through the IEEE SEM Website: **http://r4.ieee.org/sem/** and clicking on the **SEM meetings list** button near the bottom of the left-hand banner.

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 (recently refreshed!)





ExCom Meeting Schedule

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

Below is the 2024schedule 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 2024 meetings. Or link your personal calendar to the SEM Web calendar.

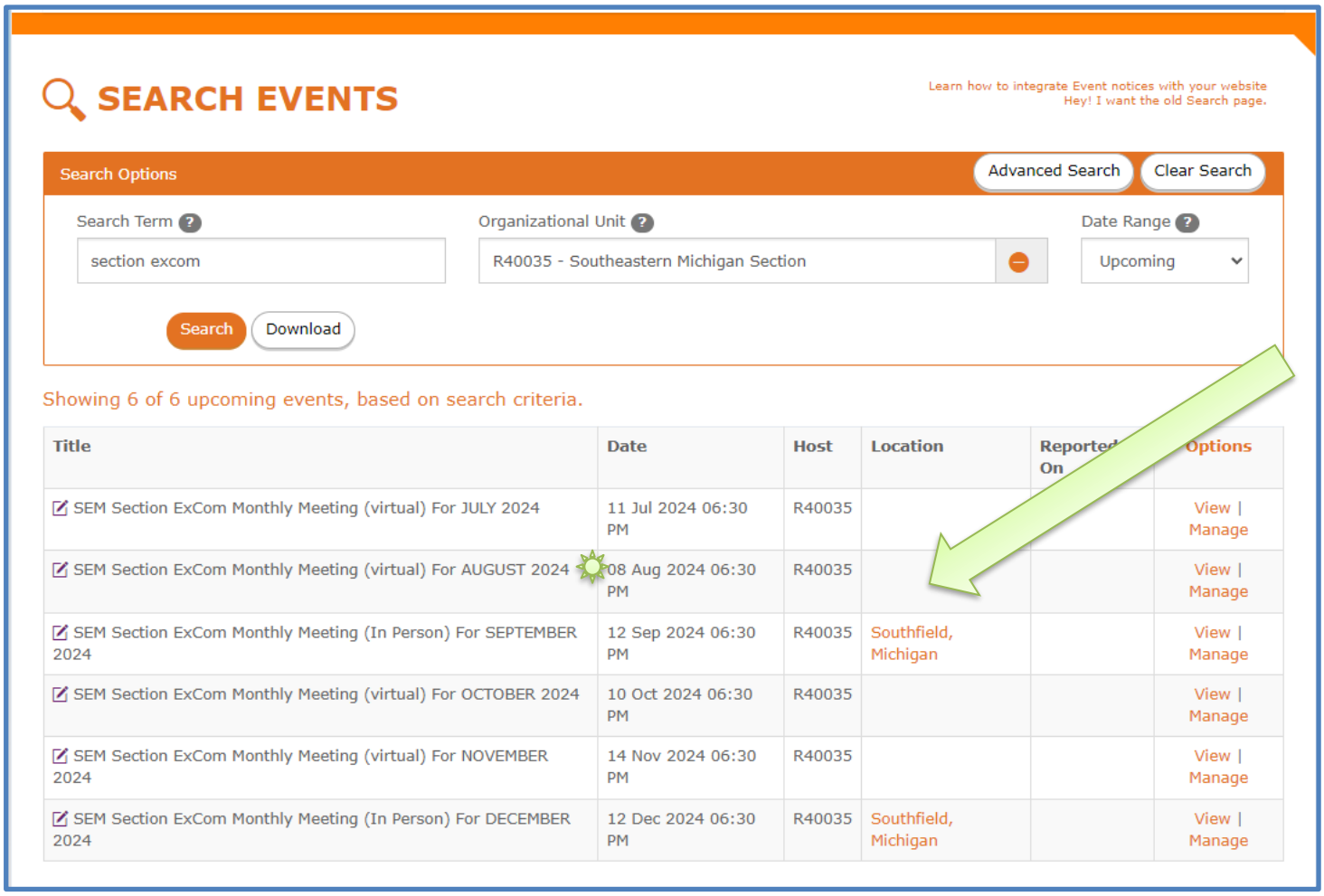
Section Administrative Committee (ExCom) Meeting Schedule for 2024: (clickable links)

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 (all clickable links)	*Date & Start Time, Duration*
Section ExCom Monthly Meeting (virtual) For AUGUST	08 Aug 6:30 PM, 1 hour
Section ExCom Monthly Meeting (Hybrid) For SEPTEMBER	12 Sep 6:30 PM, 2 hours
Section ExCom Monthly Meeting (virtual) For OCTOBER	10 Oct 6:30 PM, 1 hour
Section ExCom Monthly Meeting (virtual) For NOVEMBER	14 Nov 6:30 PM, 1 hour
Section ExCom Monthly Meeting (In Person) For DECEMBER	12 Dec 6:30 PM, 2 hours

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

Section Administrative Committee (ExCom) Meeting Schedule for 2024: (screen snapshot)



SEARCH EVENTS

Learn how to integrate Event notices with your website
Hey! I want the old Search page.

Search Options | Advanced Search | Clear Search

Search Term: section excom

Organizational Unit: R40035 - Southeastern Michigan Section

Date Range: Upcoming

Search | Download

Showing 6 of 6 upcoming events, based on search criteria.

Title	Date	Host	Location	Reported On	Options
SEM Section ExCom Monthly Meeting (virtual) For JULY 2024	11 Jul 2024 06:30 PM	R40035			View | Manage
SEM Section ExCom Monthly Meeting (virtual) For AUGUST 2024	08 Aug 2024 06:30 PM	R40035			View | Manage
SEM Section ExCom Monthly Meeting (In Person) For SEPTEMBER 2024	12 Sep 2024 06:30 PM	R40035	Southfield, Michigan		View | Manage
SEM Section ExCom Monthly Meeting (virtual) For OCTOBER 2024	10 Oct 2024 06:30 PM	R40035			View | Manage
SEM Section ExCom Monthly Meeting (virtual) For NOVEMBER 2024	14 Nov 2024 06:30 PM	R40035			View | Manage
SEM Section ExCom Monthly Meeting (In Person) For DECEMBER 2024	12 Dec 2024 06:30 PM	R40035	Southfield, Michigan		View | Manage

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
OR
sharan.kalwani@ieee.org
nilesh.dudhaia@ieee.org
k.williams@ieee.org
cgjohnson@ieee.org
akio@emcsociety.org

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,
2018~2019~2020~2021~2022-2023-2024

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

Southeastern Michigan Section Website
http://r4.ieee.org/sem/

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

Section Website Event Calendar
(Select the "SEM Calendar" button - top row)
SEM Facebook Page
(Select the "" button under the top row)
https://www.facebook.com/groups/ieeesemich
SEM LinkedIn Page
(Select the "" button under the top row)
https://www.linkedin.com/groups/1766687/
SEM Twitter Account (new)
(Select the "" button under the top row)
https://www.twitter.com/ieeesemich
SEM Collabratec *Community* Page
https://ieee-collabratec.ieee.org/app/section/R40035/IEEE-Southeastern-Michigan-Section

SEM Collabratec *Workspace* Page
https://ieee-collabratec.ieee.org/app/workspaces/5979/IEEE-Southeastern-Michigan-Section/activities

SEM Instagram (new)
https://www.instagram.com/ieeesemich/

SEM Officers:
For a complete listing of all - Section - Standing Committee - Affinity Group - Chapter and Student Branch SEM Officers Roster on the web page (top banner)

Section Officers

Section Chair
Sharan Kalwani

Section Vice-Chair
Aneesh Mathai

Section Secretary
Christopher Johnson

Section Treasurer
Ramesh Sethu

Standing Committees:

Section Adviser
Mohamad Berri

Wavelengths Editor
Sharan Kalwani

Educational Committee
Anthony Will (Chair)

Finance Committee
Subra Ganesan (Chair)

Membership Development
Mohamad Berri (Chair)

Awards & Nominations
Jerry Song (Chair)

PACE
Sharan Kalwani (Chair)

Student Activities
Michael Anthony & Hafeez Jimoh (Co-Chairs)

Student Mentors
OPEN

SECTION Student Rep
OPEN

Technical Activities
Jeffery Mosley

Information Management

IEEE Southeastern Michigan
Electrical and Electronic Engineers Creating Our Future

IEEE Southeastern Michigan

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

Leadership Meetings

SEM Executive Committee Monthly Teleconferences:

- 2nd 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.)

OR

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