

## Staying active

Sections keep members engaged at the local level for the benefit of SAE International at the national and international levels.





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# There's a word for changing processes when circumstances dictate

“Pivot.”

That is the word that keeps popping into my mind lately. Has anyone seen the episode of “Friends” in which Ross and Rachel are moving a couch up a staircase and Ross keeps saying “pivot” to get up the stairs? Well that is the word and scene I keep thinking about. With the unforeseen circumstances related to COVID-19, we have all been forced to come up with a plan B. Being the manager of SAE’s 46 active sections, this is exactly what we are all being forced to do.

Say you’re planning on having a face-to-face meeting – need to pivot. Thinking about having a networking event – nope, pivot. What about a go-karting event – pivot! With the impact of Covid-19 and all the challenges it has set in place for us, I think everyone is looking for their own unique way to pivot.

For those of you that do not know me, my name is Abby Hartman. I have been with SAE for eight years and have been managing the SAE Sections and Collegiate Chapters for the past four years. Before COVID-19, everything was going smoothly and sections were continuing to hold the engaging meetings they always had been. But with social distancing rules and large groups of people not being able to gather,



This editorial was written for *Update* by Abby Hartman, SAE Local Activities Specialist.

it was time to get creative. Now, instead of clinking together glasses at a networking event, we are clicking mouses over a computer screen. Instead of sitting in a room all together, we are sitting individually in our homes watching the same content.

The Washington D.C. Section made the first pivot by holding a virtual game show happy hour on April 29th in a Family Feud style game. They asked 15 questions about work/ life balance during quarantine and got over 100 responses! It was such a hit that they had another Trivia Happy Hour on June 24 with questions revolving around cars, rails, and maritime. A great way to bring people together while eliminating the germs.

Next, the Mid-Michigan Section utilized the WebEx line SAE put in place for

sections to use. They put on a virtual meeting in late May that drove more than 50 people to log on. Mark Zachos, an involved section member, delivered a very interesting presentation around Cybersecurity. To make it happen, there were three practice meetings to make sure the technology and content was all in place. After a trial run, they were ready for prime time.

The Twin Cities section also put on a virtual Collegiate Design Night in mid-May that had 67 people in attendance. Each student was able to present for 10-15 minutes about their CDS design. It was done flawlessly and without any issues.

2020 has been an interesting year, to say the least. So, what else do we need to pivot from? Perhaps instead of going to an event, we now need to attend virtually. Maybe instead of going to a standards meeting in person, we log on via conference call. But one thing we will always supply to our members is connectivity. Even though we cannot connect face-to-face right now, we are still able to find loopholes that allow our opinions to be heard and allow knowledge to grow.

Regardless of the delivery method, SAE will be here for you. Face-to-face or virtual, we are here and always will be. ■

### **Officers and Directors of the Board**

The Executive Nominating Committee invites SAE International members to submit names for consideration for the Board of Directors, Slate of Nominees. Key qualifications of SAE Board members include: a demonstrated, strong commitment and knowledge of the SAE Vision and Ends; active membership and participation in the society; and the time and talents to serve in a leadership role. Nominations may be submitted at any time via email [encnominations@sae.org](mailto:encnominations@sae.org) or fax +1.724.776.5944.

# SAE EV Charging Public Key Infrastructure Project launches

SAE International in May announced plans to launch the SAE EV Charging Public Key Infrastructure (PKI) project, an industry-led, pre-competitive research project to strengthen electric vehicle charging system security. The project is expected to begin technical work in the second quarter of 2020 to develop a secure EV charging industry PKI platform that is agnostic to charging system and protocol standards.

The project will result in strong end-to-end cybersecurity between the electric vehicle (EV) and the rest of the charging ecosystem. The resulting PKI platform will improve security to ensure confidentiality, integrity, and availability of advanced charging capabilities.

SAE gathered a core team of 10 companies from the EV charging sector to develop the fundamental documents for the project. A partial list of the core team includes ABB, ChargePoint, eMobility Power, Fastned, Ford Motor Co., General Motors, and Shell. These companies have jointly developed the groundwork for the SAE project to create a suitable PKI, including design, governance, and operations for the EV charging industry.

“SAE International has led a representative industry group to develop the work scope for a worldwide EV charging



**A core team of 10 companies from the EV charging sector has been assembled to develop the fundamental documents for the SAE EV Charging Public Key Infrastructure (PKI) project.**

industry PKI platform that is secure, trusted, scalable, interoperable, and extensible,” said Jack Pokrzywa, Director of Global Ground Vehicle Standards at SAE International. “This is yet another example of SAE engaging industry in pre-competitive projects like this to target critical industry problems and develop solutions by industry, for industry.”

As initially announced in December 2019, SAE will leverage the expertise and experience of its CRP Program to convene industry members to develop a targeted solution for this critical use case that will be extensible to other automotive and mobility use cases. The SAE CRP Program, which is managed by SAE staff with research driven by expert industry participants, uses agile development techniques to deliver targeted research to solve crucial industry problems and lead to SAE International standards. ■

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<b>Events</b>	Enjoy discounted registration on most SAE owned conferences, including SAE's flagship event, WCX.
<b>Awards and Recognition</b>	Advance in your career and earn recognition from your peers through more than 60 awards (many of which are for members only) across all mobility industries
<b>Leadership</b>	Enhance your leadership skills through volunteer activities, board positions, and Section Officer Roles. Get recognized as an SAE Fellow – the highest grade of membership – given to long-term members who have made a significant impact on society's mobility technology.
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<b>The Career Counselor Series</b>	Gain free access to multiple videos on topics like stress management, public speaking, time management and more.
<b>SAE Propel</b> connection.sae.org/sae propel	Take advantage of SAE's engagement portal, where you can advance your career, guide the future generation and connect to the engineering community by signing up as a volunteer.
<b>Update Enewsletter</b>	Stay up to date on current topics in mobility engineering with a members-only subscription to SAE's online newsletter, featuring SAE news, technical articles and member content.
<b>Sections</b>	Become involved in your local SAE Section, where you can meet with other engineers from your area who are working in the mobility technology field and keep you up-to-date on the latest technical information. You also have the opportunity to serve on your section's governing board or committee.
<b>Career Center</b>	View employer job listings seven days in advance of the general public.

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**PROPEL** participate.  
engage.  
volunteer.

## Propel: All about volunteerism

SAE Propel, SAE International's volunteer engagement platform at [connection.sae.org/saepropel](https://connection.sae.org/saepropel), helps you find all of SAE's current volunteer and engagement opportunities from across the organization in one place. Getting involved with SAE will help you maintain sharp skill-sets and build upon skills you already have. It's a great way to explore new fields and expand your work portfolio in your field. And don't forget: It's the perfect way to meet new people who share the same passion as you for bettering their personal development, industry, and our future generation. By engaging with SAE you can:

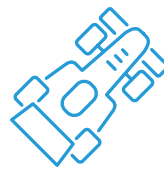
- Advance your career or gain career experience
- Provide inspiration and guidance to the future generation
- Connect to the engineering community

Get started today by visiting [connection.sae.org/saepropel](https://connection.sae.org/saepropel) and setting up your profile. This will get you matched with

opportunities that suit your skills, interests, and expertise, from leading a committee to getting involved in STEM programs and many other ways in which you can give back to the organization.

### Volunteer Opportunities

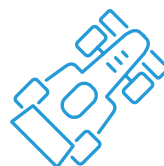
The three highlighted volunteer opportunities for this issue of *Update* are:



[Seeking Participants for the Active Safety Roadside Object Surrogate Task Force](#)



[Seeking Associate Editors for the Journal of Vehicle Dynamics, Stability, and NVH](#)



[Seeking participants for Micromobility Battery Standards Committee](#)

For a complete list of all volunteer and engagement opportunities, please visit SAE Propel. Link to the opportunity list [here](#).

## Featured volunteer

As Fuel System Responsible Engineer at Northrop Grumman in Palmdale, Calif., Joe Batwinis performs development, analysis, and sustainment engineering for aircraft fuel systems.

In terms of volunteering for SAE International, he re-wrote the mission for SAE's 2020 AeroConnect Challenge, which is a brand new student competition for college students. Batwinis served as a judge for the competition as well. AeroConnect Challenge is a UAV design competition, without a build component. The mission for the 2020 competition was to design support-UAVS for fighting wildfires.

"After that," he told *Update*, "I helped SAE get the actual ruleset finalized quickly so we could get it out to students as soon as possible." After the teams submitted their reports, Batwinis recruited some of his colleagues to help with judging them.

He has also been a National Technical Inspector for Baja SAE every year since 2014. Batwinis organized the 2016, 2017, and 2019 Baja SAE California competitions. Organizing is a job much broader and more time-consuming than technical inspection.

"My motivation to volunteer with SAE, both for Baja SAE and AeroConnect, comes



**As organizer of the Baja SAE California 2019 competition, Joe Batwinis handled announcer duties at the awards ceremony, among many other duties.**

from two things: One, a sense of wanting to pay-forward the benefits that I derived during my participation in Baja SAE as a student; and two, it's fun! I enjoyed Baja SAE when I was a student, and it's still a ton of fun traveling to the events (and occasionally organizing one) and seeing how the series has progressed. Getting to be involved now at a high level in both Baja and AeroConnect has been really rewarding," Batwinis said. ■

**PROPEL** participate, engage, volunteer.



## Save the date: 2020 SAE Annual Business Meeting



The 2020 SAE Annual Business Meeting will be held on Wednesday, September 9, 2020, 11:00 AM-12 Noon (Eastern time). Participation will be virtual. Registration details to follow in September *Update* and via SAE Member email. Shown above, speaking at the 2019 SAE Annual Business Meeting, is SAE CEO David Schutt.



# GOVERNMENT/ INDUSTRY MEETING

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## Staying active

Sections keep members engaged at the local level for the benefit of SAE International at the national and international levels.



**Luke Osmokrovic, Director of Student Activities with the SAE Central Ontario Section, makes remarks at its SAE Students' Night event.**

As any engineer knows, a machine works only as well as the parts that make it up.

One of the most important parts of the SAE International machine is Sections—the network of regional units run by SAE Members that keeps the larger organization humming.

“SAE Sections really are the engine that keeps the SAE machine running smoothly,” said SAE Director of Membership Donna Edenhart. “From local networking events

that allow them to share information across industries, to gaining knowledge through industry speakers, to supporting the next generation through SAE Collegiate Chapters, sections—and the amazing volunteer SAE Members who run them—are the heart of SAE. They help SAE International spur the kind of innovation that keeps the mobility industry moving forward in high gear.”

To be considered an official SAE Section,



Among SAE Twin Cities Section members are (left to right) Ken Ratekin, Jerry Betz (Section Chair), Dan Peterson (former Chair, current Board Member), Ted Colburn (former Board Member, retired), Venkat Parameshwaran (Program Chair), and Jon Ness (Treasurer).

the unit must have at least 100 SAE Members on the roster and elect a board every year. Currently, SAE has 46 active sections covering the continental U.S., and several overseas. Among other responsibilities, sections must hold at least four “technical events” per year. Though not required, many sections raise funds for scholarships and other purposes. Main funding is provided by SAE International.

The SAE Section Year runs from June 1 to May 30. *Update* figured that now, soon after the end of the last section year, would be a good time to canvas a few section leaders about what major activities they held over the past year. As noted in this issue’s editorial (page 2) by SAE’s sections manager, Abby Hartman, several sections adapted to the COVID-19 pandemic by

holding their most recent meetings virtually.

Among them was the Twin Cities Section, which serves Minnesota and western Wisconsin. At the May 11 “Collegiate Design Night” event, eight student teams made Goto Webinar presentations to about 40 section members who logged on. “All student presentations were excellent,” said Venkat Parameshwaran, Twin Cities Section Program Chair.

Before the pandemic struck, the section was able to have an in-person meeting in March featuring Charles A. Liedtke, PhD, of Strategic Improvement Systems, LLC, making a presentation on “Big Data Analytics (BDA) for Mobile Products.” In January, Benjamin Edlavitch of Greenberg Traurig LLP gave a presentation called “Patent Law Overview.”



**It might look like "The Brady Bunch," but "Family Feud" was the model for the Washington, DC, Section's "virtual game show happy hour."**

Fun was the main activity on the agenda at the Washington, DC, Section's virtual meeting held April 29. Section Chair Jennifer Morrison described the affair as a "virtual game show happy hour" operating on the Family Feud model. Section members were asked to answer 15 survey questions, and the top 3 answers for each were revealed. Those with the most "top answers" got \$25 Amazon gift cards.

Also compiled was the most interesting answer for each question. One of the questions was: What month do you think you will return to the office? Top answers:

1. June
2. May
3. July

The most interesting answer to the question was, "Neveruary. I think that my company wants me working from home... reduces the cost of office space."

The Chicago Section on May 5 held its first-ever Zoom meeting, with Parker-LORD hosting and making a presentation on adhesives for lightweight assembly and EV battery packs. "We had a great turnout for this event with plenty of positive feedback," Tim Hicks, SAE Chicago Section Chair, told Update. "Our section also participated as co-sponsors for three other webinar-based events, even into this summer."

But the section's "most successful event of the year" was held January 21. It involved a tour of Blackdog Speed Shop in

Lincolnshire, Ill, and presentations by the owners about the racing performance company’s operations. In all, 51 people attended.

Almost 60 people attended the Mid-Michigan Section’s May 11 virtual event featuring a presentation by Mark Zachos, Founder and President of DG Technologies and Chair of the SAE Diagnostics and Security Standards Committees. According to Bernard Santavy, Mid-Michigan Section Chair for 2019-2020 and 2020-2021, much effort—led by Mark Pope, Program, Future Planning, and Vice Chair of the section—went the organizing and rehearsing the program on the Webex platform. Asked what the key was to the event’s success, Santavy said, “I would say topic and timeliness, plus the reputation of Mark



**Tim Hicks, SAE Chicago Section Chair, introduces speakers from Blackdog Speed Shop to SAE Members at a January 21, 2020, section event.**

Zachos as an expert in the cybersecurity field made this an ‘I want to watch’ event.”  
 Another one of SAE’s more active regional units is the Carolinas Section. Like



**The team from ETS in Canada finished first overall in the Baja SAE Mexico 2019 competition.**



**Winners of best paper awards at the SAE Taipei Section's 24th Vehicle Engineering Conference on November 29, 2019.**

many other sections, an evening devoted to presentations by students from the section-affiliated regional collegiate chapters is one



**SAE Carolinas Section Board Member Jon M. Quigley told Update that section has awarded two college scholarships for the 2020-21 academic year, \$1,500 each to graduating high school seniors entering their freshman year at university. Several other SAE sections also provide scholarships.**

of its most popular and important activities in any given year. The Carolinas Section hosted Collegiate Night event at Hendricks Motorsports Facility in Charlotte, NC, on February 27, 2020. The event was attended by 151 students comprising 14 teams from 9 different universities in the North Carolina and South Carolina area. The agenda included a tour of the facilities as well as dinner and networking time to talk with sponsors and other attendees, but culminated in approximately a 10-minute presentation of each team's project. The winning teams received checks and a book from SAE International on project management for automotive engineers.

Carolinas Board Member Jon M. Quigley also noted that the section has awarded two college scholarships for the 2020-2021



**Participants and attendees gathered for a group photo at the 2019 International Conference on Engines & Vehicles (ICE), a joint venture between the SAE Naples Section and other groups.**

academic year, \$1,500 each to graduating high school seniors entering their freshman year at university. Many other sections also provide scholarships.

“SAE Students’ Night” was the first activity of 2019-2020 for the Central Ontario (Canada) Section. Members/judges deemed Western Formula Racing (Electric) from Western University as having made the best presentation and awarded it \$1,000, according to David Yeates, Director of Programs with the section. An additional \$1,600 was awarded to the other five teams

at the event held June 27, 2019, on the campus of McMaster University in Hamilton.

Tours of two major automakers’ Ontario plants and a presentation at McMaster University by representatives of the McMaster Automotive Resource Centre rounded out the Central Ontario Section’s program year. “2019-2020 was a successful year for our chapter,” said Yeates. “We added new members to the governing board and successfully promoted a variety of events to engage and excite the membership.”



The SAE Mexico Section has taken the idea of “student night” to its ultimate, organizing the annual Baja SAE Mexico competition that in 2019 was held in Toluca, state of Mexico, Mexico. More than 40 teams from around the world took part in the competition, which uses the Baja SAE rulebook.

The SAE Taipei Section held its 24th Vehicle Engineering Conference on November 29, 2019, hosted by the Engineering College of Kunshan University of Science and Technology in Tainan, Taiwan. More than 100 research and technical papers addressing various vehicle engineering areas were presented, and over 200 people attended. Four invited speeches related to green and new energy technology were presented in the morning, with oral presentations and poster sessions held in the afternoon.

As it had for the preceding four years, SAE Taipei (Taiwan) section and the JSAE Kanto Section hosted three engineering students from Japan at the conference to connect and enhance the Taiwan-Japan relationship.

Another unit that hosts an engineering conference as one of its main activities is the SAE Naples Section in Italy with its International Conference on Engines & Vehicles (ICE). According to the section, ICE is the most important scheduled appointment in Europe for SAE Members, organized every two years and held on Capri island in the Mediterranean as a joint venture with international research institutes and the helpful support of Istituto Motori – National Research Council. It was created almost 30 years ago with the aim of encouraging the exchange of scientific and practical knowledge in the main theme of the vehicle, and it has always been imagined as a forum to promote the cooperation between industry, research laboratories, and universities. ■

By Patrick Ponticel, *Update* editor

**Section officers** – Please submit short reports on your main activities so we can publicize them in *Update*. Send to [update@sae.org](mailto:update@sae.org).

# ON-BOARD DIAGNOSTICS SYMPOSIUM

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**[sae.org/obdvirtual](https://sae.org/obdvirtual)**

## DOSSIER: Dr. Pranab Saha of Kolano and Saha Engineers, Inc.

As Founder and Co-Principal Consultant of Kolano and Saha Engineers, Inc., Dr. Pranab Saha, an SAE International Fellow, is in charge of both administrative and technical activities—“the principal in charge of all automotive-related programs including measurements, analysis, and diagnostic activities,” he told *Update*. “I serve as the direct link between the client and the company’s staff/resources, and I am continuously involved with advanced projects for future vehicles to seek ways to reduce noise.”

He and Rick Kolano founded the Waterford, Mich.,-based company in 1986, seven years after Saha earned his PhD in mechanical engineering with a specialty in acoustics from Georgia Institute of Technology. Previous to that, he earned his MS in engineering sciences from the University of Florida and BS in mechanical engineering from the University of Calcutta, 1973.

Saha worked as an engineer at two different companies before turning to consultant work in 1984 with Blachford Engineers, PC, of Pontiac, Mich. There, he was given a one-year engineering service assignment with an OEM company in an advanced interior acoustics area. “I supported various advanced vehicle acoustics projects related to performance,



**Dr. Pranab Saha posing in a familiar work environment, an anechoic chamber, 2017.**

functionality, ease of installation, and cost,” he told *Update*. “This assignment, although it was only for a year, helped me to understand the process the OEMs have to go through to manufacture cars.”

Read on to learn more about Saha.

### **What is the most interesting activity that you are engaged in at the moment?**

My favorite work is the opportunity to work with various supplier companies. I assist them with meeting target levels set by the OEMs via engineering, analysis, measurements, and training. Quite often, my company works as an independent test laboratory, where we work with competing companies.

I also like working with SAE as a volunteer member in developing and



**Saha is a two-time winner of the Forest R. McFarland Award, 1997 and 2011.**

revising a few standards. Some of these are very critical standards for the mobility industry. I am also trying to convey these standards to the worldwide mobility industry, so the SAE standards would be better accepted.

In my personal time, I teach Bengali to adults who are interested to know the Bengali language and culture. Since I was born in West Bengal, India, I feel this is very important to keep our Indian culture alive for our children and grandchildren and anyone else who is interested.

### **What past activity, accomplishment, or memory gives you the most satisfaction?**

In my professional life, I get the most satisfaction when the customers say that I was truly able to help them with their NVH problems. Also, professionally, I get a great



**Sharing a moment in Las Vegas with Dr. John Johnson (middle) and Johnson's wife. Saha and Johnson, both SAE Fellows, were there in November 2019 as an award for being selected to SAE's first Top Contributor Class.**

satisfaction knowing that I am a Fellow Member of two professional organizations (SAE International and Engineering Society of Detroit).

On a personal level, it's greatly satisfying to know I have a wonderful family that supports me with my SAE activities.

### **In what way is SAE helpful to you?**

Very interesting question. I think SAE has been helpful to me in many different ways. Of these, the most important one is networking. The next important one is the fact that I have heard from many other NVH professionals that I am well known in the circle. This is all because SAE has been helpful to me. SAE has given me opportunities to serve on many SAE committees and interact with many SAE staff members and SAE members and volunteers.

On a personal level, I have had the



**Setting up a cold-weather test at the Transportation Research Center in East Liberty, Ohio.**

opportunity to travel to places that I might not have otherwise. Finally, and most importantly, I have been able to make many enduring friendships.

### **In what ways have you been involved with SAE?**

I have been an SAE Member since 1987 and have been involved with SAE in many different ways. For example, I have been involved with the SAE Acoustical Materials Standards Committee since 1988, serving Chair from 1996-2001. In the area of conferences and events, I have been actively involved in the Noise and Vibration General

Committee since 1988, serving as the 2005 N&V Conference Chair. I also chaired the SAE Engineering Meetings Board from 2013-2014 as part of my nine years on the board overall, and have served on a number of various other committees.

Also, I have been an SAE Professional Development instructor for SAE since 1993 and Lead Instructor of SAE's first academy, the Vehicle Noise Academy, since its inception in 1998. I was the first web seminar instructor for SAE in 2008.

### **Has any SAE Member been particularly helpful or inspirational to you?**

Yes, the late Ralph Hillquist. He gave me my start in almost everything I have done in my professional life, although I have never worked for him or with him directly. I was hired by H.L. Blachford, my first job, because he had an opening for a project where Ralph was on the customer (MVMA) side. Later, I also got involved with SAE NVC because of Ralph, who worked with SAE to start this conference in 1985.

Also, the late Jim Groening was very instrumental in my professional life. He hired me at Blachford in 1978, and gave me opportunities for me to gain engineering and professional skills. Later, he hired me back from California to work for him at Blachford Engineers, PC. Jim was also an SAE Member, and in the past, Ralph used to work for Jim at the GM Milford Proving



With wife, Laura.

Grounds. Over time, Jim became a very dear personal friend of mine.

**What advice can you offer current and prospective SAE Members to get the most out of their SAE membership?**

My suggestion to current and prospective SAE Members is to get involved. SAE is a section-based organization. Get involved in your section. I know you can learn almost everything from the internet nowadays, but there is no substitute to a live meeting or discussion, sharing your thoughts and views.

**What do you like to do in your free time?**

During my free time, I like to watch movies, do gardening, and my favorite is playing with my grandchildren. As mentioned before, I also teach Bengali (through the “Path Bhaban” group at the organization Bichitra).



Performing in the role of picnic chef.

**Is there anything else you’d like to add?**

I like to teach. I have enjoyed teaching for SAE. I am very thankful to the late Bob Hand, who initially took me in as a co-instructor for an SAE course, so I could get started. Later, in 1998, when SAE started the Academy program, Vehicle Interior Noise was the first one, and I was chosen as the lead instructor. ■

Would you like to be featured in the Dossier section of *Update*? If so, contact the editor at [update@sae.org](mailto:update@sae.org).

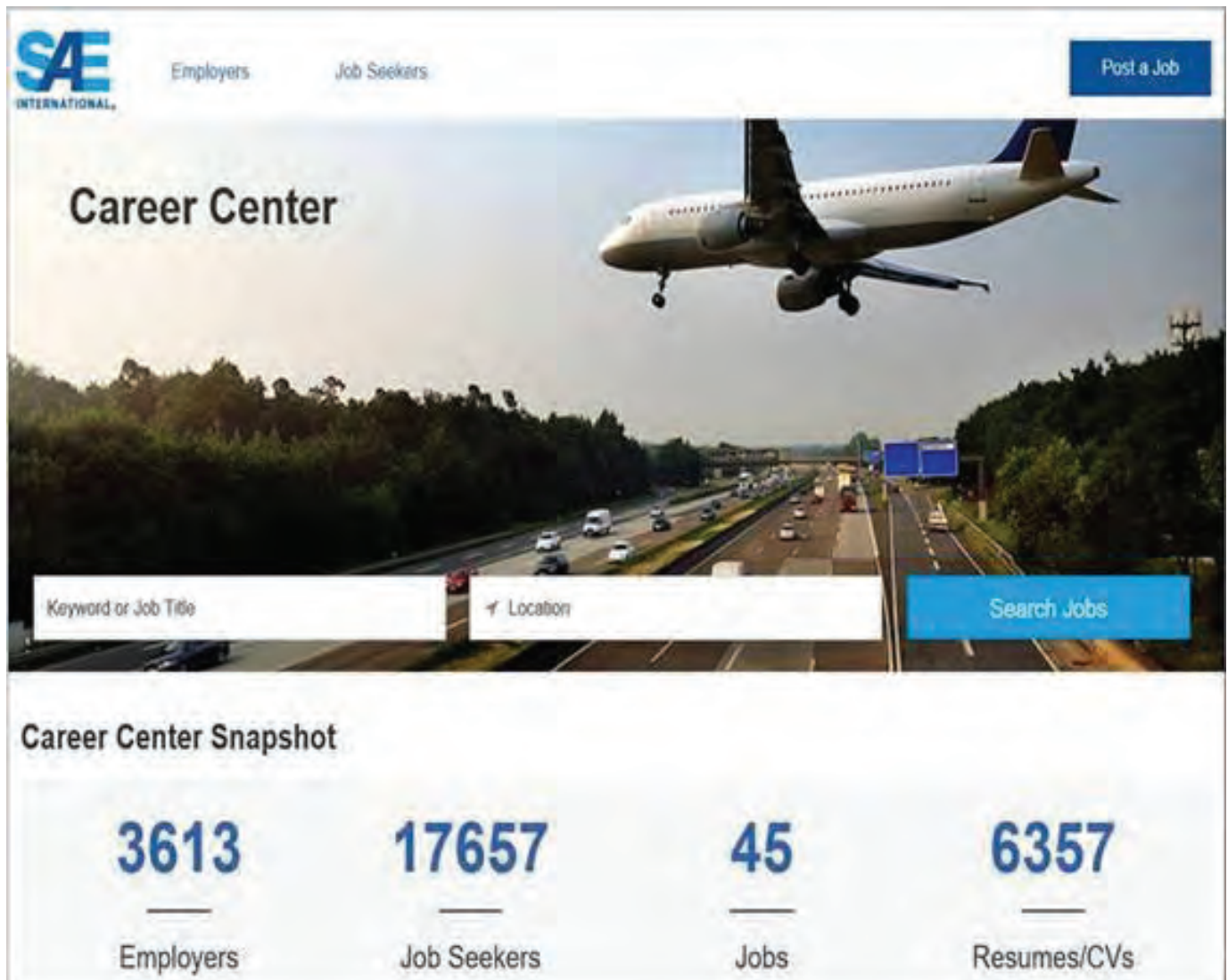
# Farewells

SAE International has been notified of the deaths of the following SAE Members.

Charles W. Miller, 18 years of membership

Virgil Morgan, 18 years of membership

Grady W. Troute, 13 years of membership



The screenshot shows the SAE International Career Center interface. At the top left is the SAE International logo. Navigation links for 'Employers' and 'Job Seekers' are visible, along with a 'Post a Job' button. The main heading is 'Career Center'. Below this is a search bar with two input fields: 'Keyword or Job Title' and 'Location', followed by a 'Search Jobs' button. The background image features an airplane flying over a highway. Below the search bar is a 'Career Center Snapshot' section with four statistics:

Employers	Job Seekers	Jobs	Resumes/CVs
3613	17657	45	6357



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# What's Happening in the Member Connection

It all starts here: This is your link to SAE's Membership Community and where you can discuss the latest technical topics with other mobility industry engineers, give back through volunteerism, learn about your benefits, and much, much, more!



## Hot Topics

SAE is a global community—post questions and discuss the latest technical topics from anywhere in the world. Below are a few popular recent threads. Add your voice today!

### HOW CAN DESIGN ENGINEERING AND FINANCE WORK BETTER TOGETHER

David Perner writes: "I've recently become interested in the interface between finance and engineering and how painful it can be when this communication breaks down, causing shocks to the design and/or budget when changes do finally get propagated. I'm also trying to learn how it can be made better and save us all some time and stress." – Add your voice [here](#).

### COPPER CONDUCTOR AMPACITY

David Toler writes: "I've been searching SAE standards, without success, to find how much current a low-tension cable is permitted to carry. Does SAE adopt the National Electric Code ampacities (NFPA 70), or have I just not located the correct SAE standard? – Add your voice [here](#).

### CONNECTING THE PAST AND THE PRESENT FOR ENGINEERS AND INNOVATORS (EVOLUTION FIELD)

Lahcen Hanouni has a simple but fun question: "Which one is sweeter and more enjoyable to drive: the old classic cars or sophisticated electronic cars full of amenities?" – Add your voice [here](#).

## Member Connection Chat...

The [Chat](#) series is a two-day session in Member Connection with a subject matter expert(s) on a particular technical topic. The subject of the next chat is TBD. Click [here](#) to review past chat threads, including the most recent ones on range-extendors for electric vehicles and VR tools for the automotive industry. Those chats were hosted by, respectively, [@Scott Curran](#) of Oak Ridge National Laboratory and [@Amol Gulve](#) of Volvo Group North America.

## SAE Mentor Program

### Featured Mentor:

Elana Chapman, PhD  
General Motors LLC



Dr. Elana Chapman has been at General Motors for 13 years, the past 11 as a Senior Fuels/Biofuels Engineer and the preceding two years in the Advanced Engineering - Diesel group. She supports the internal Advanced Engineering and Production Combustion groups with test fuels development and technical analysis, and leads projects related to fuels and engine performance to meet future vehicle emissions and performance standards.

Chapman has been an SAE Member throughout her career and participated in SAE student programs while in graduate school at Penn State University. She graduated in 2008 with a PhD in Fuels Science and an M.S. in Mechanical Engineering.

“I support SAE through my volunteer efforts as the Vice Chair of the Fuels & Lubricants Committee,” she told Update. “I am honored that I was elected to this position so that I can continue to support and mentor my SAE family of colleagues.”

“I have realized through my career that so many people have given back to me by mentoring me through my journey,” Chapman continued. “Now, it is my turn to be there for my colleagues, including especially my women colleagues who need my words of wisdom and encouragement. My passion is around continuing to foster more young women to consider careers in engineering and engineering technology, and in crossing the finish line with their degrees. I can do that by sharing my story and my experiences with them along their journey, and being a part of their mentoring team and “personal board of advisors.”

Learn more about the SAE Mentor Program or sign up as a mentor/mentee [here](#).

## What's New

### Coming soon: student exclusive community in Member Connection

We are excited to announce the launching of a new Student Community in [Member Connection](#) this month, where only current student members will have access to the community. This is where you can ask questions and have discussions amongst your student peers. The Membership Team will also update you on your member benefits and upload helpful resources for your Chapter. Stay tuned for more information!

### Let UPS help you come back strong

As safer at home measures start to relax and we focus on rebuilding, lean on your SAE UPS Savings Program to address logistics challenges and deliver the tools and resources you need to help your business come back stronger than ever. Save 50% on Next Day Air Services and 30% on Ground Commercial and Residential Shipments. Plus, manage shipments like a pro using UPS My Choice for Business to easily see all of your inbound and outbound shipments in one place. Enroll and start saving!

Questions? Call: +1.800.MEMBERS (636.2377), 8:00 a.m. – 5:00 p.m., to speak with a member care specialist.

## Ward off stroke and vascular disease

What would your doctor say...if he/she could actually see inside your arteries?

Now it's possible with a simple ultrasound screening that can reveal dangerous plaque buildup or blockage, from Life Line Screening.

These screenings have proven to be safe and accurate in detecting your risks for stroke and vascular disease – so you and your doctor can do something about it before it's too late.

The lifetime risk of stroke for middle-aged men and women is 1 in 5 for women and 1 in 6 for men, and it takes a terrible toll on families.

And many people who suffer from them experience with no prior symptoms or warning signs.

That's why so many doctors have recommended Life Line Screening to their patients. Last year alone, over 7,000 Life Line Screening customers reported that their doctors recommended Life Line Screening. These include:

- Carotid Artery Screening (Plaque)
- Heart Rhythm Screening (Atrial Fibrillation)
- Abdominal Aortic Aneurysm Screening
- Peripheral Arterial Disease Screening

SAE has partnered with Life Line Screening to bring you these screenings at a



bundled discount. The screenings are \$70 each but are \$135 for SAE Members. The Osteoporosis Risk Assessment may be added for only an additional \$10.

The screenings will take only about one hour of your time, and you will be notified immediately of any serious findings.

Life Line Screening has screened over 8 million people, and customers sometimes tell us that they feel the screenings saved their lives.

What's inside your arteries? Call toll-free +1.877.504.9461 now to schedule your screening using priority code BSAE001. ■

To become a member of SAE International's Partner Program and secure a spot in *Update* to promote your product, please contact Corey Dillon, SAE Member Relations Specialist, at [corey.dillon@sae.org](mailto:corey.dillon@sae.org).

## New SAE standard defines common taxonomy for cooperative driving automation



**J3216 describes machine-to-machine (M2M) communication to enable cooperation among vehicles operating with their driving automation features engaged, other road users, and infrastructure owners and operators, such as traffic signals and work zones.**

SAE International recently published SAE [J3216 \(“Taxonomy and Definitions for Terms Related to Cooperative Driving Automation for On-Road Motor Vehicles”\)](#). Developed by the SAE On-Road Automated Driving (ORAD) Committee, this standard builds on SAE J3016 (“Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems”) and aims to provide clarity while offering a foundation for the advancement of vehicle automation technologies with terms, definitions, and taxonomy focused on Cooperative Driving Automation (CDA), a key building block that supports all levels of automation.

“CDA sits at the intersection of two important transportation technologies: automation and connectivity,” said Shawn Kimmel, Vice Chair of the ORAD Committee. “It helps enable benefits such as cooperative intersection and traffic management applications that reduce travel times and/or improve road operations by coordinating the movement of multiple vehicles in proximity to one another. The development of a common language helps enable discussions between automobile manufacturers, technology companies, and infrastructure stakeholders to work together to achieve industry goals.”

J3216 describes machine-to-machine (M2M) communication to enable cooperation among vehicles operating with their driving automation features engaged, other road users, and infrastructure owners and operators, such as traffic signals and work zones. The cooperation supports or enables performance of the Dynamic Driving Task (DDT), and is defined as four classes, A through D, based on increasing amounts of cooperation entailed in each successive class – Status-sharing, Intent-sharing, Agreement-seeking, and Prescriptive. Ultimately, cooperation among multiple participants and perspectives in traffic help improve safety, mobility, situational awareness, and operations.

“SAE is uniquely positioned to bring together industry and infrastructure to create an agreed upon language through

which CDA can safely evolve,” said Keith Wilson, Technical Program Manager at SAE International. “As the need for CDA increases with the realization of all levels of automation, J3216 has considerable potential impacts on traffic, operations, and safety in the world of automation.”

### Also published...

Among the many other standards published by SAE recently is [J3101 \(“Hardware Protected Security for Ground Vehicles”\)](#). It provides a comprehensive view of security mechanisms supported in hardware for automotive use cases, along with best practices for using such mechanisms. It also describes how the hardware protected security environment provides a platform to implement access control by enabling secure authentication, authorization, and access enforcement. ■

# Call for experts for Truck and Bus Automation Safety Committee

The Truck and Bus Automation Safety Committee under the SAE International Global Ground Vehicle Standards group is looking for experts to participate in standards development.

The Truck and Bus Automation Safety Committee is part of the Truck and Bus Brake and Advanced Driver Assistance Systems Steering Committee and is responsible for developing, reviewing, and approving Standards, Recommended Practices, and Information Reports related to the safety of heavy vehicle automation systems. Automation systems include:

- 1) Active Safety Systems are to include Vehicle / Operator Warning Systems (such as, but not limited to, Lane Departure, Collision Warning, Pedestrian / Object Detection / Recognition Systems).
  - 2) Proactive Safety Systems (such as, but not limited to, Adaptive Cruise Control, Pre-Crash System Actuation, Collision Mitigation Systems).
  - 3) Vehicle Guidance and Control Systems (such as, but not limited to, Vehicle Platoons and Platoon Systems, Vehicle-to-Vehicle, Vehicle-to-Infrastructure Communication Systems, Automated Coupling Systems (physical and communication coupling), Brake-blending Systems, Lane-Keeping Systems, Lane-  
Changing systems), Docking system (both freight and passenger).
  - 4) Human-vehicle interface systems (dealing with the SAE five levels of automation).
  - 5) Automation System Performance Validation Systems (such as, but not limited to, Pre-trip and Post-trip automation system inspections, Post-repair automation system functional verification systems, law-enforcement support systems). Included are trucks, tractors, trailers, buses greater than 10,000 lbs (4500 kg) GVWR designed primarily for highway use.
- If you are interested in participating, contact Jana Light at [jana.light@sae.org](mailto:jana.light@sae.org). ■



**The Truck and Bus Automation Safety Committee is part of the Truck and Bus Brake and Advanced Driver Assistance Systems Steering Committee and is responsible for developing, reviewing, and approving Standards, Recommended Practices, and Information Reports related to the safety of heavy vehicle automation systems.**

**COMING SOON...October 1 is nomination deadline to recognize exceptional innovators and SAE contributors**

SAE Arnold W. Siegel Humanitarian Award

SAE Ralph K. Hillquist NVH Lifetime Achievement Award

SAE John Melvin Motorsport Safety Award

SAE IHI Achievement in Boosting Award

SAE/Ramesh Agarwal Computational Fluid Dynamics Award

Arch T. Colwell Cooperative Engineering Medal

SAE/InterRegs Standards and Regulations Award

James M. Crawford Technical Standards Board Outstanding Achievement Award

## Still accepting nominations by Sept. 1 for the following awards

[The Henry Ford II Distinguished Award for Excellence in Automotive Engineering](#) honors an SAE Member (individually or with their team) who uses their engineering skills to achieve product or manufacturing process contributions that are assessed to have had the greatest positive effect on the passenger car, truck, and bus industries.

[The SAE John Johnson Award for Outstanding Research in Diesel Engines](#) recognizes outstanding accomplishments and leadership in the area of diesel engines. Two awards are given each year, one for Best Paper and the other, the Diesel Engine Research Medal, given to an individual for outstanding leadership in research and development in the field of diesel engines through a singular accomplishment or lifetime achievement. ■



**The latest winner of the John Johnson Medal Award is Stefan Pischinger, PhD, President & CEO of FEV Group GmbH.**

# SAE AWARDS

INTERNATIONAL®

## 2020 NOMINATION DEADLINES CALENDAR

### JANUARY 15

- William R "Bill" Adam Formula SAE® Vehicle Development Grant

### FEBRUARY 1

#### Aero & Student

- Daniel Guggenheim Medal
- Clarence L. (Kelly) Johnson Aerospace Vehicle Design and Development Award
- Franklin W. Kolk Air Transportation Progress Award
- Marvin Whitlock Award
- SAE Aerospace Engineering Leadership Award
- William Littlewood Memorial Lecture
- Steven M. Atkins Ability and Achievement in Science, Engineering and Technology (AASET) Award
- Cliff Garrett Turbomachinery Engineering Award
- Henry O. Fuchs Student Award

### MARCH 1

#### Leadership/Innovation/Excel in Education

- SAE Sid Olsen Engineering Executive of the Year Award
- SAE Foundation Young Industry Leadership Award

- Ableson Award for Visionary Leadership
- SAE/AEM Outstanding Young Engineer Award
- Bill Agnew Award for Outstanding AWIM Volunteers
- Lloyd Reuss Award for Teaching Excellence
- Gary Dickinson Award for Teaching Excellence
- SAE International/Magnus Hendrickson Innovation Award

### MAY 1

#### Innovation

- Franz F. Pischinger Powertrain Innovation Award

### JUNE 1

#### Innovation

- Arnold W. Siegel International Transportation Safety Award
- Edward N. Cole Award for Automotive Engineering Innovation
- Max Bentele Award for Engine Technology Innovation
- Environmental Excellence in Transportation (E2T) Award
- A4A/SAE Nondestructive Testing (NDT) Innovation Award
- SAE/Timken-Howard Simpson Automotive Transmission and Driveline Innovation Award

### JULY 1

#### Leadership

- Subir Chowdhury Medal of Quality Leadership
- SAE Fellow Grade of Membership
- Barry D. McNutt Award for Excellence in Automotive Policy Analysis
- J. Cordell Breed Award for Women Leaders
- Rodica Baranescu Award for Technical & Leadership Excellence
- L. Ray Buckendale Lecture
- SAE Delco Electronics Intelligent Transportation Systems Award

### AUGUST 1

#### Student

- Henry O. Fuchs Student Award

### SEPTEMBER 1

#### Technical & Literature

- Forest R. McFarland Award
- SAE John Johnson Award for Outstanding Research in Diesel Engines
- Henry Ford II Distinguished Award for Excellence in Automotive Engineering

### OCTOBER 1

#### Student & Innovation

- Myers Award for Outstanding Student Paper
- Rumbaugh Outstanding Student Leader Award
- SAE Arnold W. Siegel Humanitarian Award
- SAE Ralph K. Hillquist NVH Lifetime Achievement Award
- Honeywell Outstanding Collegiate Branch
- Arch T. Colwell Cooperative Engineering Medal
- SAE/InterRegs Standards and Regulations Award
- James M. Crawford Technical Standards Board Outstanding Achievement Award
- SAE John Melvin Motorsport Safety Award
- SAE IHI Achievement in Boosting Award
- SAE/Ramesh Agarwal Computational Fluid Dynamics Award

### NOVEMBER 1

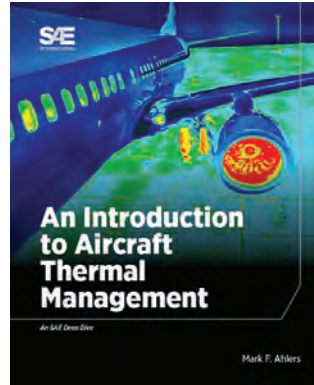
#### Faculty

- Ralph R. Teetor Educational Award
- SAE Medal of Honor

Nominate a deserving peer and view all awards at [sae.org/participate/awards](http://sae.org/participate/awards).

## Beating the heat in aircraft

SAE International recently published a new book, [An Introduction to Aircraft Thermal Management](#), that discusses how to manage heat in an aircraft to meet



comfort requirements for passengers and safety requirements for the aircraft itself. Maintaining thermal comfort is critically important, not a trivial operation. This primarily involves removing heat and protecting equipment, systems, and structures that could raise their temperature beyond design limits.

Almost three years in the works, this is a seminal title as new challenges in managing thermal loads in more-electric aircraft become apparent. Fully illustrated and amply referenced, *An Introduction to Aircraft Thermal Management* provides a very balanced approach between theory and practice, best practices, and technical insights.

The book is written by Mark F. Ahlers, PhD, a just-retired Boeing Technical Fellow who spent 30 years developing the analytical tools and processes that form the basis for aircraft thermal management on Boeing Commercial Airplane programs. He



**The author was designated Boeing's first Thermal Marshal.**

also supported thermal design efforts for the International Space Station, launch vehicle proposals, commercial and research satellites, and military derivatives of commercial aircraft programs.

When thermal issues were recognized as a serious threat to the economic implementation of a more-electric systems architecture and more temperature-sensitive composite structures on the 787 program, Ahlers was given responsibility for technical oversight of thermal activities as Boeing's first Thermal Marshal.

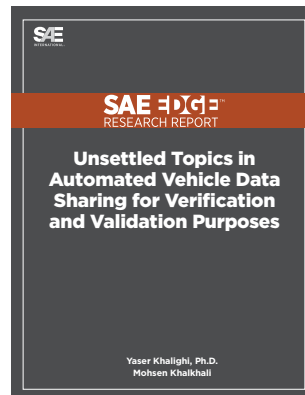
Ahlers previously authored two other SAE-published books, *Aircraft Thermal Management: Integrated Energy Systems Analysis*, and *Aircraft Thermal Management Systems Architecture*. ■



# New SAE series addresses the unsettled topics of mobility technology

SAE EDGE Research Reports provide state-of-the-art and state-of-the-industry examinations of the most significant topics facing the mobility industry today, including Connected and Automated Vehicle Technologies, Electrification, and Advanced Manufacturing. With a dedicated focus on pre-consensus or unsettled technologies, they offer a structured framework and methodical approach for thinking about and working with rapidly shifting technologies.

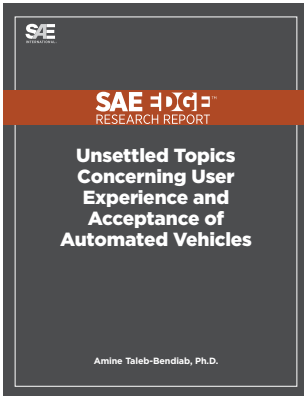
Among the recently published SAE Edge Research reports is [Unsettled Topics in Automated Vehicle Data Sharing for Verification and Validation Purposes](#), which discusses the issue of sharing the terabytes of driving data generated by automated vehicles (AVs) on a daily basis. Perception engineers use these large datasets to analyze and model the automated driving systems (ADS) that will eventually be integrated into future “self-driving” vehicles. However, the current industry practices of collecting data by driving on public roads to understand real-world scenarios is not practical and will be unlikely to lead to safe deployment of this technology anytime soon. Estimates show that it could take 400 years for a fleet of 100 AVs to drive enough distance to prove that they are as safe as human drivers.



**Mohsen Khalkhali and Yaser Khalighi are co-editors of *Unsettled Topics in Automated Vehicle Data Sharing for Verification and Validation Purposes*.**



[Unsettled Topics Concerning User Experience and Acceptance of Automated Vehicles](#) addresses the topic of user acceptance of automated driving, analyzing the user experience for a more intuitive and safe driving experience. It examines the requirements for safer driver/user engagement with driving for the various SAE automation levels, with analysis of consumer sentiment toward automated driving—both consumer excitement about the perceived benefits and dislikes or concerns about the technology. The findings from surveys about drivers’ experience with

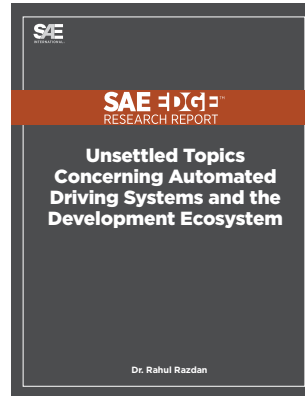


**Amine Taleb-Bendiab is editor of Unsettled Topics Concerning User Experience and Acceptance of Automated Vehicles.**

advanced driving assistance technologies and its application to automated driving is also brought to the surface of the discussion, together with driver profiles observed during a user-centric experience in an immersive automated driving cockpit.

With over 100 years of operation, the current automobile industry has settled into an equilibrium with the development of methodologies, regulations, and processes for improving safety. In addition, a nearly \$2 trillion market operates in the automotive ecosystem with connections into fields ranging from insurance to advertising. Enabling this ecosystem is a well-honed, tiered supply chain and an established development environment.

Autonomous vehicle (AV) technology is a leap forward for the existing automotive industry; now the automobile is expected to manage perception and decision-making tasks. The safety technologies associated



**Rahul Razdan is editor of Unsettled Topics Concerning Automated Driving Systems and the Transportation Ecosystem.**

with these tasks were presented in an earlier SAE EDGE Research Report, Unsettled Technology Areas in Autonomous Vehicle Test and Validation. In a newer SAE EDGE Research Report, [Unsettled Topics Concerning Automated Driving Systems and the Transportation Ecosystem](#), senior executives from the automotive ecosystem explored the impact of AV technology as they faced the prospect of this disruptive technology entering their marketplace. Interestingly, stable use-models and market penetration were all gated primarily by the demonstration of AV safety. Building on these previous verification and validation (V&V)-related reports, “Unsettled Topics Concerning Automated Driving Systems and the Development Ecosystem” explores the open issues in the shift of the development and supplier environment toward a new AV-enabled future. ■

## Introducing ‘Programming Each Other,’ a new AWIM curriculum



More than three years in the making, General Motors’ latest fully funded initiative in partnership with SAE International answers the growing need for information technology (IT) education in schools.

GM and SAE saw an opportunity to make a difference in schools—and the future

### Call to action

Help deliver the SAE AWIM Programming Each Other learning experience to teachers and students in your community. Contact Joy Lancaster at the SAE Foundation, [joy.lancaster@sae.org](mailto:joy.lancaster@sae.org).

workforce pipeline—across the nation, particularly in areas without computer labs or computers in students’ homes. Computing occupations [make up 58% of all projected new jobs](#) in STEM fields, and computer science (CS) is one of the [highest-paid bachelor degrees](#). Yet [not many schools](#) teach CS, let alone require CS credits for high school graduation.

In this environment demanding updated skills for new careers, GM and SAE developed the curriculum for Programming Each Other with partner Education Development Center, with the goal of filling the gaps between the

jobs of tomorrow and the education of today. Programming Each Other will become the newest challenge from the "A World In Motion" (AWIM) program, nurturing STEM skills at the Pre-K8 level.

Each lesson in the Programming Each Other Challenge includes optional tech extensions and supporting videos, as well as opportunities for students to apply their knowledge and present their findings in a collaborative environment. However, Programming Each Other is designed as an "unplugged" way to introduce students to IT, so it doesn't require access to computers to help students grasp basic CS fundamentals. Instead, students learn to write programs by developing computational thinking skills with increasingly complex tasks.

Programming Each Other engages students with a challenge—they receive a letter from a fictional publisher requesting ideas for a book to introduce young



children to programming. The publisher asks students to write programs for accomplishing everyday tasks.

Within this exciting premise, students explore basic setbacks inherent to programming, and new levels of difficulty are designed to introduce specific concepts, including loops, conditional statements, variables, and error handling. To make learning goals more complex, students write examples of flawed

## About the SAE Foundation

The mission of the SAE Foundation is to encourage and increase student achievement and participation in science, technology, engineering, and math (STEM) to build a diverse, STEM-fluent workforce. Funds raised by the SAE Foundation support SAE International's award-winning A World In Motion (AWIM) program, Collegiate Design Series (CDS), awards, and scholarships. SAE's STEM education programs enable students to develop the 21st

century skills needed to succeed in real-world work environments and connect classroom learning with real-life application. Overall, SAE's STEM programs have reached more than 6 million students worldwide and engaged more than 30,000 STEM industry professionals as volunteers. See the [SAE STEM program in action](#). Learn more and get involved at [saefoundation.org](http://saefoundation.org).

instructions as well as effective programs, using technical terminology to explain their revisions. This creates an effective way for students to learn the fundamentals of programming.

After an initial smaller pilot test, the curriculum was field tested across the United States with educators for grades 3-6. Teachers shared in-depth feedback that further strengthened the curriculum.

“My students gained a lot from this unit. They were able to work with the coding vocabulary at a hands-on level, which I think is so helpful for them,” said one educator who participated in the field test. “My school also participated in Hour of Code while we were doing this unit. My students were excited to add loops and if-then conditionals to their coding since they actually knew what those things were now.”

Another educator added: “I like the idea of using everyday tasks to teach the basics of how programming begins, simply because students today are so plugged in to digital technology.”

Programming Each Other is a good introduction to computer science, said another educator who participated in the field test. “The students were engaged and eager to do each lesson. They never seemed bored, overwhelmed, or overly frustrated.”

Programming Each Other joins GM's other funded challenges with AWIM: Fuel Cell, Gravity Cruiser, Making Music, and Cybersecurity: Keeping Our Network Secure. The AWIM program also includes Straw Rockets, Pinball Designers, Rolling Things, Engineering Inspired By Nature, Skimmer, JetToy, Motorized Toy Car, and Glider.

This new AWIM challenge is another step in SAE's educational continuum. In addition to Programming Each Other and Cybersecurity: Keeping Our Networks Secure, SAE is seeking partners to develop future IT curricula for different grade levels.

Your involvement in launching additional programs will make a big impact in filling tomorrow's IT workforce gap. With the support of our donors, we've reached more than 6 million students and brought more than 30,000 industry professionals into classrooms across the globe.

**With help, the SAE Foundation will inspire curiosity in STEM—visit [sae.foundation.org/donate](https://sae.foundation.org/donate) to find out how. ■**

# MACS and SAE partner to address shortage of qualified technicians

The SAE Foundation was honored to partner with the Mobile Air Conditioning Society (MACS) recently on a luncheon panel on the topic of the technician shortage and solutions during the recent MACS Training Event and Trade Show in Nashville. Founded in 1981, MACS is the leading non-profit trade association for total vehicle climate and thermal management.

Peter Meier, Director of Training at Motor Age, along with MACS Technical Advisor, Ward Atkinson, joined moderator Steve Schaeber, Technical Editor and Manager of Service Training for the panel discussion.

Atkinson introduced the MACS audience to the SAE Foundation and its mission to encourage and increase student achievement and participation in science, technology, engineering and math (STEM) to build a diverse, STEM-fluent workforce. Funds raised by the SAE Foundation support SAE International's award-winning A World In Motion® (AWIM) program, Collegiate Design Series™ (CDS), awards and scholarships. Atkinson is one of the many industry leaders who have served as formal mentors and industry volunteers to students participating in the SAE AWIM and CDS STEM education programs.

Read the editorial of this panel discussion in the recent issue



**Sixty-six-year SAE Member Ward Atkinson has served as a formal mentor and industry volunteers to students participating in the SAE AWIM and CDS STEM education programs.**



**Elvis Hoffpauir is Editor-in-Chief of *ACTion*, the magazine of the Mobile Air Conditioning Society.**

of ACTION magazine, published by MACS: [read.nxtbook.com/macs/action\\_magazine/april\\_2020/stop\\_complaining\\_about\\_the\\_te.html](https://read.nxtbook.com/macs/action_magazine/april_2020/stop_complaining_about_the_te.html)

## Call to action

Keep STEM learning alive and ensure AWIM resources remain free to support educators and families, whether the learning environment is in person, virtual, or remote. Donate today at [saefoundation.org/donate](https://saefoundation.org/donate).



Atkinson also joined Elvis Hoffpauier, President of MACS, for an Automotive Service Association (ASA) podcast that aired in March celebrating MACS' 40th anniversary. Both had a lot to share

### Did you know?

That of the students who participate in AWIM...

- 94% developed an increase interest in math and/or science concepts.
- 72% displayed a significant increase in their math and/or science scores.
- 81% showed a change in attitude toward math and/or science.
- 80% showed Increased awareness of, or interest in, an engineering career.

View this [infographic](#) to discover how SAE AWIM impacts the global workforce.

about the founding and growth of MACS to where it's going. Since 1991, MACS has assisted more than 1 million service technicians to comply with the 1990 U.S. EPA Clean Air Act requirements for Section 609 certification in refrigerant recovery and recycling to protect the environment.

Hoffpauier and Atkinson discuss the close collaboration between MACS and SAE International (formerly Society of Automotive Engineers), EPA, and the international service community around industry standards, since the mid-1980's. They also share concerns about the lack of qualified technicians.

“The servicing and repair of vehicles on the road today is no longer just a ‘part changing’ activity,” said Atkinson. “To meet, and solve the consumer repair needs, knowledgeable experienced technicians are required to use diagnostics procedures. For proper operation, many replaced parts need additional re-calibration.”

The SAE Foundation is well positioned in its mission to fill the workforce pipeline with qualified technicians and engineers through support of SAE's expanding portfolio of proven Pre-Professional STEM Education solutions.

Listen to the interview: [bit.ly/ASApodcast-MACS-SAE](https://bit.ly/ASApodcast-MACS-SAE). ■

# CLASSIFIED ADVERTISING

**Abby Hartman**  
**Recruitment Sales Manager**  
**Phone: +1.724.772.4099**  
**Fax: +1.724.776.3393**  
**abby.hartman@sae.org**

**Post your resume and search job openings at [sae.org/careers/](http://sae.org/careers/).**

*SAE assumes no responsibility for the statements set forth in any listing or the availability or existence of such listed positions. SAE does not review or warrant the qualifications or statements of those responding to a listing.*

## JOB OPPORTUNITIES

**CONTROLS DESIGN ENGINEER**, Milford, MI, General Motors. Engr, design, dvlp, implement, verify, validate & calibrate default values for psgr vehicle algorithm-based embedded controls sys in Engine Control Module in C/C++ languages, to ensure embedded SW commands meet vehicle level ASIL safety reqmts incldg CAN, LIN & Automotive Ethernet integration levels, & comply with U.S. EPA & CARB regs. Design & dvlp strategy for controls & diagnostics for gasoline particulate filters (GPF) for Europe & China markets to reduce Particulate Matter emissions. Apply model based control strategies to control & diagnose GPF in exhaust syss. Assist in writing & submitting certification docs for GPF functional areas for certification, & include ISO 26262 SW safety standard in embedded control syss designs. Master, Electrical, Automotive, or Mechanical Engrg. 12 mos exp as Engineer, dvlpg vehicle control syss or calibration solutions & performing diagnostic verification testing, & meeting CARB regs, or related. Mail resume to Ref#3061-69, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**SENIOR EMBEDDED SOFTWARE ENGINEER**, Warren, MI, General Motors. Design, debug, test, integrate, validate & deliver OTA update packages for psgr vehicle embedded telematics & infotainment ECUs incldg In Vehicle Infotainment, Communication Gateway/Center Stack Modules, using C/C++ programming language, in Android, Linux & QNX multi-threaded RTOS, in Agile methodology, for future vehicle programs & global markets (N.A., Europe, China, & RoW). Execute source control, issue tracking & static anlys using Git, Gerrit, Jenkins, IBM DOORS/Synergy/RTC/Rhapsody, Parasoft, CANalyzer, CANoe, CAPL scripts, & VSpy tools. Use State Machine, Threads, Socket programming, Mutex, Semaphore & message queues for SW dvlpmt. Master, Electrical Engrg, Computer Engrg, or related. 12 mos exp as Engineer, designing & integrating control SW for embedded ECUs for psgr vehicle or off road machine control using C/C++ programming language, in Linux & multi-threaded RTOS, in Agile methodology, for U.S. & global markets, or related. Mail resume to Ref#49581, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**PROGRAM VALIDATION ENGINEER**, Warren, MI, General Motors. Engr & dvlp program validation plans & ensure on-time execution of validation deliverables for Body in Frame performance, small & mid-size psgr vehicle programs. Dvlp program LADV plan. Review & optimize LADV sub-plans based on analytical CAE results (incldg thermal, & N&V, & crash), program history, & vehicle content strategies to optimize the plans for shared HW usage to minimize prototype materials costs. Create Preproduction Property Request (PPPR) for on-time submission to Pre-Production Op. (PPO) incldg calculation & reporting of psgr vehicle counts, vehicle build completion dates, required vehicle content options, & specific testing, dvlpmt & tuning instrumentation (thermocouples & pressure sensors) based on usage & test region. Dvlp & issue U.S./China market small & mid-size psgr vehicle platforms full vehicle mnthly Validation Metric & High Risk reports incldg Chassis, Body, Exterior, Interior, Electrical, Powertrain, Thermal, & Safety/Certification, to Validation Leadership. Bachelor, Mechanical, Automotive, Electrical, or Production Engrg. 24 mos exp as Engineer, creating or executing PPPR or build plan for on-time submission to PPO incldg calculation or reporting of vehicle build completion dates, content options, & tuning instrumentation (thermocouples & pressure sensors) based on usage & test region, or related. Mail resume to Ref#48466, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.



## JOB OPPORTUNITIES

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**CONTROLS INTEGRATION SIMULATION ENGINEER**, Warren, MI, General Motors. Convert physics equations into virtual vehicle models to simulate conventional & Battery Electric Vehicle full vehicle behavior, incldg chassis & propulsion sys behavior in dynamic & steady states to enable co-simulation. Use & apply optimization techniques incldg Kriging methodology & Response Surface Modeling, & large scale Multidisciplinary Optimization (MDO) techniques, in C/C++ & Python, & MATLAB & Simulink tools, to leverage CAE tool capabilities for suspension tuning. Dvlp, simulate, execute controls sys integration, & create psgr vehicle sys & subsys MIL/SIL/HIL/DIL models to simulate complete virtual vehicle models in low & high fidelity, using MATLAB, Simulink, Adams, CarSim, & other tools. Master, Mechatronics, Electrical, Mechanical Engrg, or related. 24 mos exp experience as CAE Engineer, Technical Lead, or related, performing large scale MDO studies & techniques, in C/C++ & Python, using MATLAB tool, or related. Mail resume to Ref#1955-107, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**PROCESS ENGINEER-BEV ELECTRIC MOTOR (EM) COMPONENTS**, Pontiac, MI, General Motors. Engr, design, dvlp, innovate, & validate best in class mfg techniques, processes, sys & eqpmnt incldg stator & rotor assy sys to produce & improve current & future BEV EM cmpnts & assemblies incldg rotor assemblies & varnish, using NX, Teamcenter, Vismockup, E2, & ECM tools. Support production of prototype & preproduction hybrid & EMs. Dvlp & implement best practices for mfg of hybrid & EMs. Design, dvlp & implement processes & eqpmnt for assy. Validate EM cmpnt production eqpmnt though Types 1 & 2 gage R&R studies. Update layouts & footprints of Dvlpmt Laboratory after every eqpmnt install or removal. Perform Value Stream Mapping studies to identify bottlenecks & improve process flows. Required travel to work in Tech Center, Warren, MI, attending Lab & EM update mtngs & update attendees on Lab. dvlpmts & process documentation, & meet suppliers on Advanced Technical Work, up to 1 full workday P/WK. Bachelor, Industrial & Systems Engrg, or related. 12 mos exp as Engineer, supporting the production of prototype & preproduction of EMs, validating EM cmpnt production eqpmnt though Types 1 & 2 gage R&R studies, or related. Mail resume to Ref#2083-84, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**VALIDATION ENGINEER-OVER THE AIR (OTA) SOFTWARE**, Warren, MI, General Motors. Develop, create, & execute test plans & validate & improve Remote Reflash Master (RRM) in Central Gateway Module to identify, track & verify fixes for OTA malfunctions, crashes, & poor performance, for future psgr infotainment & telematics systems features, using CANoe, CANalyzer, IBM RTC, VSpy, RAD-Galaxy, RAD-Star, ATT, & RAD-Moon tools, & NeoVI FIRE & Vector tools HW, in vehicle & on test bench. Develop & maintain test procedure up to date based on the latest OTA functional & ISO 14229-1 UDS requirements for validation on subsyst, sys. & vehicle level. Validate Wi-Fi, Bluetooth connectivity, phone projection, & OnStar telematics connectivity, & improve HMI, in Android OS during OTA programming. Master, Electrical Engrg, or related. 12 mos exp as Engineer, developing & executing test plans & validate & improve RRM in Vehicle Communication Platform or Telematics Connectivity Platform modules, to identify & verify fixes for OTA malfunctions or poor performance, for psgr vehicle infotainment & telematics sys features, in vehicle & on test bench, or related. Mail resume to Ref#5087-08, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**FEATURE INTEGRATION ENGINEER- VISION SYSTEMS**, Milford, MI, General Motors. Engr, dvlp, test image qlty, validate, & verify performance of conventional, BEV & autonomous psgr vehicle vision based Active Safety (AS) sys features incldg Rear Vision Camera (RVC), Surround View System (SVS), Rear Camera Mirror, Performance Data Recorder, Augmented Reality Camera, Driver Monitoring/Night Vision Sys, & Trailing at cmpnt, subsystem, sys levels, using MATLAB, Simulink, Image Processing Toolbox, Cptr Vision Toolbox, IMATest, CANalyzer, CANape, CANoe, DPS & VSpy tools, & neoVI FIRE HW. Tune, calibrate, evaluate, & validate Video Processing/HMI/Center Stack Modules, Integrated Center Stack, & displays in lab w/ controlled lighting conditions. Dvlp GUI app for repetitive performance evaluation of color accuracy, luminance levels, contrast levels, high dynamic range, clarity, sharpness, edge enhancement, noise on vision based AS features at vehicle level. Master, Electrical or Electronics Engrg. 12 mos exp as Engineer, dvlp, testing image qlty, & validating performance of psgr vehicle vision based AS sys features incldg RVC, SVS, & Trailing, using MATLAB, Image Processing Toolbox, Computer Vision Toolbox, & VSpy tools, & neoVI FIRE HW, or related. Mail resume to Ref#1812, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

## JOB OPPORTUNITIES

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**DESIGN RELEASE ENGINEER-POWER CONVERTERS**, Warren, MI, General Motors. Design, engr, dvlp &release BEV high voltage power converters &technologies including On Board Charge Module to charge RESS, Accessory Power Module to provide current to vehicle syss, &Integrated Power Electronics, power inverters & AC/DC electric motors incldg rotors, rotor lamination, stators, stator lamination, conversion to low power, &assure high volume power converter production at mfg plants, using NX, Teamcenter, Vismockup, &E2 tools. Engineer &dvlp Cmpnt &Subsyss Tech Specs. Define ICD reqmts for power converter syss, subsyss, &cmpnt interfaces, analyzing &resolving packaging &clearance issues w/ engrs responsible for related engine &powertrain syss, subsystems &cmpnts. Use DFM/A, DFSS, DFMEA &DRBFM to design &validate cmpnts. Master, Electrical, Automotive, Mfg, or Mechanical Engrg, or related. 12 mos exp as Engineer or Design Engineer, designing &engrg AC electric motors for psgr vehicle or industrial applications, incldg rotors, rotor lamination, &stator lamination, or related. Mail resume to Ref#1635-303, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**VALIDATION ENGINEER**, Katcon USA, Inc., Auburn Hills, MI. Review customer reqmts &internal &supplier test data, write fatigue test reqmts, engr, improve current &new validation methods, &validate psgr &commercial vehicle (tractor) exhaust syss incldg catalytic converters, mufflers, hangers, steel inlet/outlet flanges, inlet/outlet pipes, inlet/outlet cones, shells, isolation mats, heat shields, &brackets, &diesel after-treatment devices incldg DPF, DOC, &SCR using Excel &nCode Glyphworks tools. Apply &mentor Test Lab &Junior Validation Engrs in durability fatigue concepts incldg duty cycle dvlpmt, constant amplitude, block cycle, low &high load best practices &power spectral density test inputs. Implement new validation procedures incldg Exhaust Sys Durability Test &Validation procedures. Bachelor, Mechanical or Automotive Engrg. 24 mos exp as Engineer, improving validation methods &validating psgr vehicle exhaust syss incldg hangers, flanges, pipes, cones, shells, &brackets, or related. Mail resume to Ref#14303, Katcon USA, Human Resources, 2965 Lapeer Rd, Auburn Hills MI 48326.

**COMPONENT VALIDATION ENGINEER-CHASSIS ELECTRONICS**, Warren, MI, General Motors. Create &dvlp U.S. &global test plans/strategies/designs/scopes, &test &validate Electronic Brake Control Modules (EBCM) incldg electronic &hydraulic control units, &eBoost Modules for U.S. &global psgr vehicles to meet qlty, reliability &durability (QRD) reqmts, using CEMENT, ECM, E2 tools. Analyze QRD &warranty data to ensure lessons learned. Track full test plans, incldg required supplier testing, &all internal testing required to validate cmpnts, incldg U.S. FMVSS-based regulatory testing, subsys integration testing, &functional safety testing. Test &validate psgr vehicle brake syss at cmpnt (inclgd PCBs, electronics, connectors &casings), sys &vehicle levels. Create, approve &validate Brake cmpnts test plans to meet electrical, electromagnetic compatibility, diagnostics, SW, serial data, OTA, Cybersecurity, Blackbox, Polyspace &unit testing reqmts, &monitor Tier I suppliers to ensure reqmts are met. Bachelor, Electrical, Electronics &Telecommunication, Mechanical Engrg, or related. 12 mos exp as Engineer, analyzing warranty data at cmpnt level (inclgd PCBs, electronics, &connectors), &resolving QRD issues of psgr vehicle chassis electronics syss inclgd EBCM or eBoost Modules, or related. Mail resume to Ref#34851-F155, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**QUALITY ENGINEER**, Vance, AL, Brose North America. Engr &continuously improve mfg &assy processes (6-10 assy lines), applying qlty assurance techniques &SAP ERP Qlty Mgmt module tool to increase overall equipment effectiveness &reduce failure rates, warranty claims &scrap costs during high volume production of Brose mechatronic seat adjuster syss inclgd 2-, 4-, 6-way seats at high volume cmpnt mfg plant, for JIT time delivery to OEM customer. Assure high volume production &delivery by planning, dvlpg, &implementing continuous improvement methods in Brose Productivity Sys, regulating product qlty &dvlpmt processes, identifying value added &targeting &eliminating non-value added activities. Apply DMAIC data control driven methodology, based on statistical tools such as Pareto, Process Capability, Process Performance &Design of Experiments anlysis, to identify &solve root causes of problems. Dvlp timelines &schedules for critical checks based on Customer Specific Requirements w/ respect to the IATF Standards. Master, Industrial &Systems Engineering, or related. Mail resume to Ref#5314, Brose, Human Resources, 3933 Automation Ave, Auburn Hills, MI 48326.

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## Collegiate Chapters at SAE International

Collegiate Chapters are a way for SAE International Student Members to get together on their campus and develop skills in a student-run and -elected environment. Student Members are vital to the continued success and future of SAE. While your course work teaches you the engineering knowledge you need, participation in your SAE Collegiate Chapter can develop or enhance other important skills, including leadership, time management, project management, communications, organization, planning, delegation, budgeting, and finance. For more information, or how to find your local Chapter, please visit [students.sae.org/chapters/collegiate/](http://students.sae.org/chapters/collegiate/).

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