

## SAE Foundation Honors GM President Mark Reuss with Industry Leadership Award

SAE Member is the 25<sup>th</sup> recipient of  
SAE Foundation's prestigious honor.





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# SAE International names 2020 Board Officers and Directors

SAE International’s general membership has elected the following officers to its Board of Directors. Officers and Directors began their terms on January 15, 2020.

**2021 President**

Jeff Hemphill, Vice President and Chief Technical Officer at Schaeffler Group America



**2020-2022 Commercial Vehicle Vice President**

Michael Weinert, Vice President, Engineering & Manufacturing at (Retired) John Deere



**2020-2021 Treasurer**

Andrew Jeffers, Global Products Group, Engineering Group Manager at General Motors



**Todd Zarfos**, Vice President-Engineering, Washington Design Center at The Boeing Company, who is serving as the 2020 President, was elected to his position [last year](#). Read an article about Zarfos in the February 2020 issue of *Update* [here](#).

A complete list of SAE International’s Board of Directors can be found at: [sae.org/about/leadership](http://sae.org/about/leadership). ■

**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.

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# SAE looks to tomorrow in new podcast series

Change is inevitable. And in the world of mobility, change is not only inevitable, but it is occurring at light speed. The



technology that was on the horizon yesterday is on our doorstep today. At SAE International, the charge is to meet those changes head-on. Explore them. Understand them. And convene the best and brightest to solve them.

SAE International has released a new podcast, [SAE Tomorrow Today](#), centered around key topics or events that impact the advancement of mobility knowledge and solutions for the benefit of humanity.

Hosted by Grayson Brulte, each series of *SAE Tomorrow Today* will be released as an anthology series of episodes and feature unique and dynamic perspectives from innovative industry leaders on the mobility challenges of tomorrow.

Said Brulte: "I am honored to be the host of the new SAE Tomorrow Today podcast. As the host, I look forward to having interesting, thought-provoking conversations about the future of mobility and its impact on society."

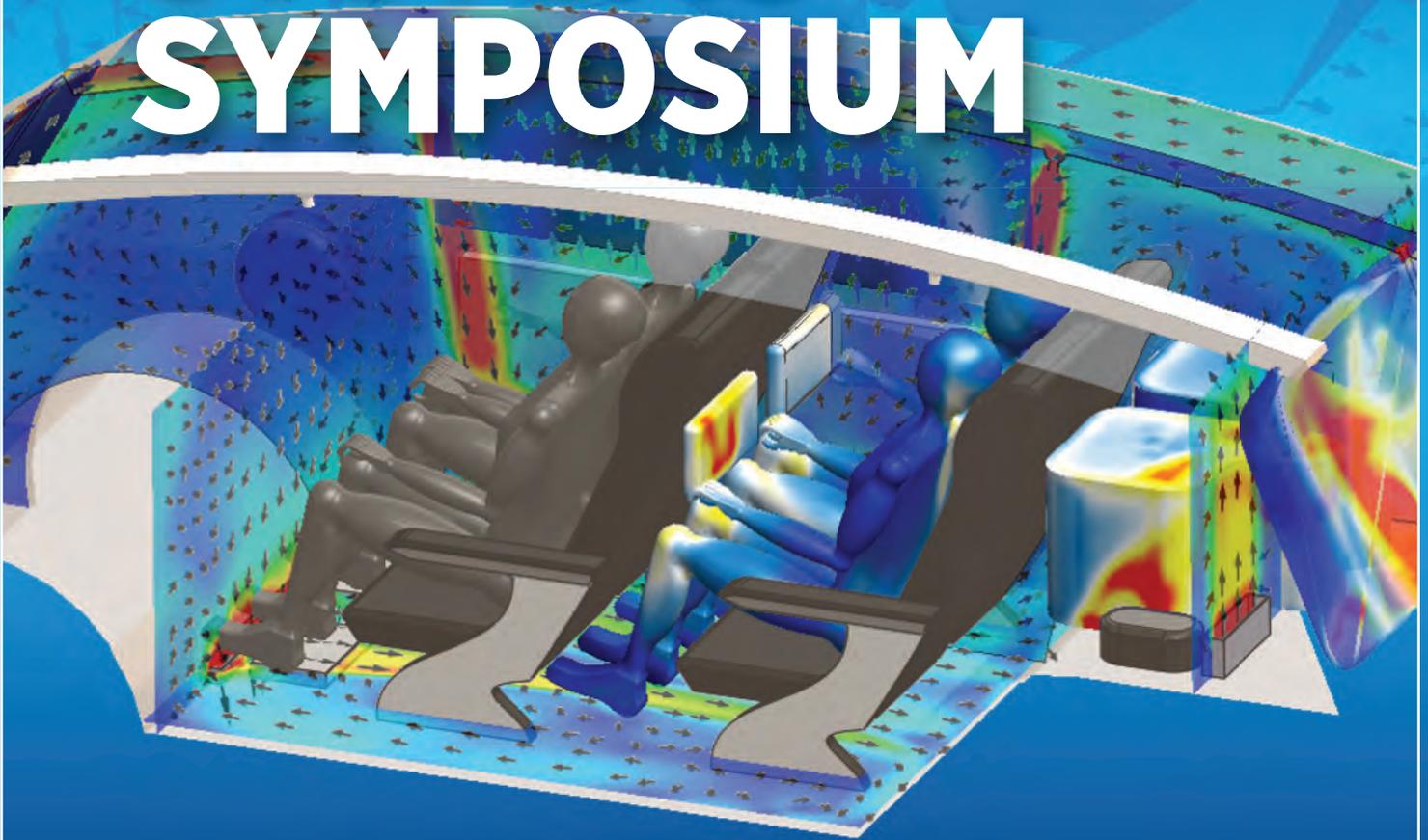


**Grayson Brulte is the SAE Tomorrow Today podcast host who will help connect the dots between the technology, communities, and individual lives.**

The first series—What inspires innovators?—is now available. The series features seven unique and impactful interviews, recorded at SAE's recent Government/Industry Meeting, with such industry trailblazers as Mark Rosekind of Zoox, Robert Brown of TuSimple, and Brad Stertz, Audi of America.

Stay up-to-date on all episodes of Tomorrow Today at [discover.sae.org/podcasts](https://discover.sae.org/podcasts) or by subscribing now on your favorite podcast platform. And if you like what you're hearing, please rate and comment on your podcast app. The more 5-star reviews, the better! ■

# THERMAL MANAGEMENT SYSTEMS SYMPOSIUM



## CALL FOR PRESENTATIONS NOW OPEN

### Contribute Your Thermal Systems Expertise

Thermal Management Systems Symposium (TMSS) brings together key stakeholders from OEMs, suppliers, and academia to share their knowledge and vision to deliver the future of the automobile from a thermal standpoint.

Share your expertise and establish yourself as a subject matter expert by submitting an abstract for consideration today.

**Abstracts due by April 1, 2020.**

[sae.org/tmss](http://sae.org/tmss)

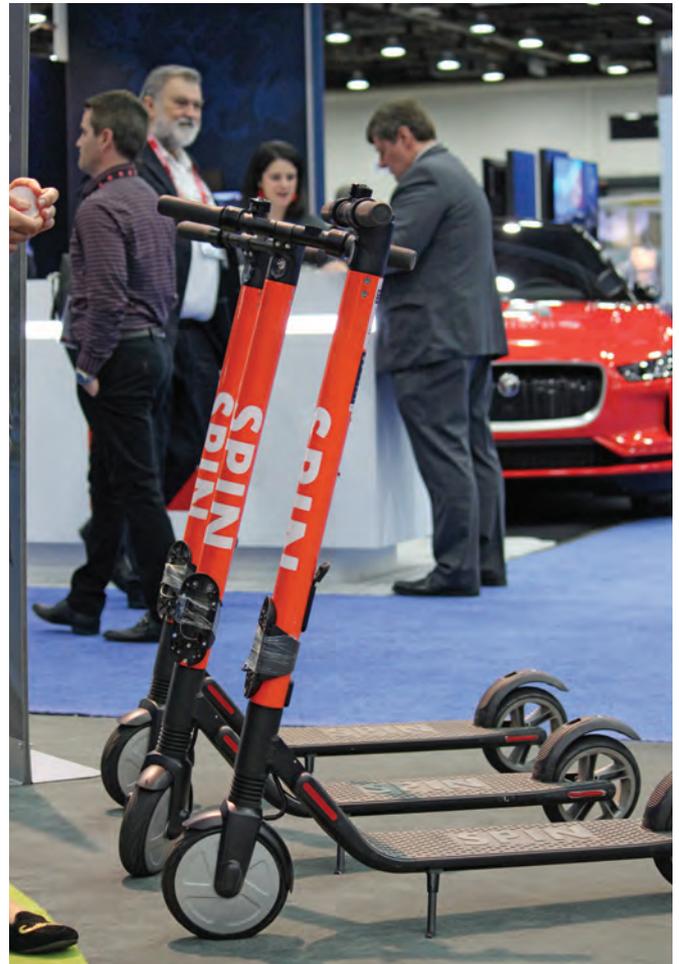
## SAE ITC convenes collaborative group to capitalize on mobility data

[The Mobility Data Collaborative](#), a multi-sector forum with the goal of creating a framework to improve mobility through data, launches today, as convened by SAE Industry Technologies Consortia (SAE ITC), an affiliate of SAE International.

New mobility services, such as shared cars, bikes and scooters, are emerging and integrating into the urban transportation landscape across the globe. Data generated by these new mobility services offers an exciting opportunity to inform local policies and infrastructure planning. The Collaborative brings together key members from the public and private sectors to develop best practices to harness the potential of this valuable data to support safe, equitable, and livable streets.

The Collaborative will leverage the knowledge of its current and future members to solve the complex challenges facing shared mobility operators and the public agencies who manage access to infrastructure that these new services require. A critical component of this collaboration is providing an open and impartial forum for sharing information and developing best practices.

Membership is open to public agencies, nonprofits, academic institutions, and private companies. Among current



**Spin displayed some of its scooters at WCX 2019 World Congress Experience.**

members are the City of Bellevue, Lyft, Spin, Uber, and the North American Bikeshare Association.

“We have identified the development of consistent mobility performance metrics and data privacy as two areas that could immediately benefit from consistency and clarity,” said Annie Chang, head of new mobility at SAE International and director

of the Collaborative. “Our objective is to build consensus among the mobility community to support effective and secure data sharing.”

Said Andrew Singelakis, Transportation Director, City of Bellevue: “The City of Bellevue is a data-driven organization that strives to be a leader on innovative transportation technology. We’re excited to contribute lessons learned from our

experience with dockless e-bikeshare to develop a common approach to collecting and reporting on mobility data. This will help communities more effectively expand shared micromobility as a travel option for residents, workers, and visitors.”

To learn more about joining the collaborative, visit: [mobilitydatacollaborative.org](https://mobilitydatacollaborative.org). ■



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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:

- 
[Help represent SAE Membership at CDS Competitions\( Aero Design, BAJA, Formula\)](#)
- 
[Urban Mobility and Smart City Workshop Organizer](#)
- 
[Technical Paper Editors](#)

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

## Featured volunteer

Lonnie Dong is the Airborne Software, Weapons Integration, & Counter Measure Manager within the Integrated Fighter Group for Lockheed Martin Corp. He is responsible for leading the corporation's weapons and counter measure development and integration on 5th Generation Fighter platforms. His employment with Lockheed Martin was a direct result of his involvement with the Collegiate Design Series, particularly SAE Aero Design.

Asked by *Update* what motivates him to volunteer, Dong responded:

"Whether it was curiosity, thrill, or just plain interest, volunteering was always a voice from within that helped set the foundation for my career. Sometimes it whispered and sometimes it shouted, but it is always the same voice that never fails to inspire me to learn, to grow, and to share.

"Here at Lockheed Martin, I take STEM volunteering to a personal level. I am committed to never waiver at the awesome responsibility of shaping and impacting the experience of our future generations, with the hopes that the experiences make them better engineers to help the thousands of men and women



**Lonnie Dong's employment with Lockheed Martin was a direct result of his involvement in the SAE Aero Design competition.**

who've put their lives on the line to defend our freedom. I will not take credit for their accomplishments, but I will take pride in the experiences I helped cultivate...with a little help from the voice within."

## Announcements

Engaging with SAE is rewarding! Each month, individuals who opt into the volunteer pool, update their profile, or sign up for a volunteer opportunity have a chance to win a \$50 gift card. Winners are drawn on the first business day of each month and notified via email. They have 30 days to claim their prize or the prize will be forfeited, and this promotion can end at any time. For more information, click [here](#). ■

**PROPEL** participate.  
engage.  
volunteer.

## SAE Foundation Honors GM President Mark Reuss with Industry Leadership Award

SAE Member is the 25th recipient of SAE Foundation's prestigious honor.

Mark Reuss was named President of General Motors in January 2019.



For leading advancements in global automotive product development and engineering, as well as philanthropic commitments to revitalizing the Detroit metro area, General Motors President Mark Reuss has earned the SAE Foundation Industry Leadership Award. He will be recognized at the SAE Foundation Annual Celebration in Detroit on May 14, 2020.

To learn how to donate to the SAE Foundation or to volunteer for one of its programs, visit [give.sae.foundation.org/donatenow](https://www.give.sae.foundation.org/donatenow)

“Mark Reuss embodies the spirit of our Industry Leadership Award, and we’re proud to honor him with this recognition. His enthusiasm and meaningful contributions to the mobility industry serve as an inspiration that our future leaders aspire to for years to come,” said Lori Gatmaitan, Director of the SAE Foundation. “Not only has Mark made significant contributions to the mobility industry through his roles at General Motors, but he has also championed the development of the mobility community and future automotive engineers by spearheading events and creating student development

# Our electric future is now.

GENERAL MOTORS



**Reuss in January 2020 announcing that Detroit-Hamtramck will be GM's first fully-dedicated, electric vehicle assembly plant, producing electric trucks, SUVs, and the Cruise Origin.**

programs for underserved youth in metro Detroit and Flint.”

“One of the most important tasks we have as industry leaders is to support and encourage the education of the next generation of engineers, from all walks of life,” said Reuss. “No one knows that better than SAE and the SAE Foundation, with its long history of supporting and promoting awareness and enthusiasm for STEM subjects among children and younger students. I’m proud and humbled to receive such an honor

from an organization as prestigious, and committed, as the SAE Foundation.”

The Industry Leadership Award recognizes individuals who have made meaningful contributions to the mobility industry. Nominees must have achieved a significant level of success in their STEM careers, demonstrated innovation and risk taking, established a new direction or developed a position that challenged their industry, and made contributions outside of their industry, exemplified through

community education, philanthropic, or government activities.

The SAE Foundation Annual Celebration raised just under \$300,000 at the 2019 event and over \$6 million since its inception in 1997. It is the organization's largest fund-raiser. Funds go to support SAE International's various activities:

- The award-winning A World in Motion (AWIM) program for children in kindergarten through eighth grade. Since 1990, more than 6 million students and 30,000 volunteers across North America have participated in this award-winning educational program.
- The SAE Collegiate Design Series (CDS) competitions take students beyond textbook theory by enabling them to design, build, and test the performance of vehicles in a variety of mobility industries. All CDS competitions prepare undergraduate and graduate students in a variety of disciplines for future employment in mobility-related industries by challenging them with a hands-on engineering design projects that require refining their skills in budgeting, communication, and project management. In 2016, SAE's CDS portfolio was expanded with the introduction of AutoDrive Challenge™, in partnership with General Motors. AutoDrive Challenge™ university teams develop and demonstrate autonomous vehicles (AV) that can navigate urban driving courses as described by SAE J3016™ Level 4 automation. GM and SAE recently announced the continuation of this partnership with AutoDrive Challenge™ II. Participating Universities will be selected through a RFP process and will be announced in 2021. In 2020, SAE AeroConnect Challenge was launched as the inaugural student engineering design competition in the SAE Emerging Technology Series, which provides an opportunity for students to think critically about current and future emerging technologies in the mobility engineering industry. There are 13 CDS events held annually across the United States and Canada. In 2019, the programs had 11,250 student participants across 722 university teams.
- SAE administers a portfolio of 61 awards presented to industry and academia professionals and students. These individuals are recognized for their exceptional accomplishments, innovations, leadership, dedication to education, and literary works in the mobility engineering world.
- Through generous contributions from various individuals, corporations, and universities, SAE International is proud to award scholarship money to both undergraduate and graduate engineering students. In 2019, SAE's 17 scholarships awarded over \$100,000 to 36 deserving students. ■

## SAE Foundation Industry Leadership Award winners

General Motors executives account for the greatest percentage of winners of the SAE Foundation Industry Leadership Award in its history, with the most recent winner, Mark Reuss, making it six.

As General Motors Co. President, Reuss leads GM's regional operations, including North America, South America, China, and General Motors International. He is leading the transformation of the company's global product development workforce and processes to drive world-class advanced technologies engineering that improve quality and speed to market.

In addition to his career accomplishments at GM, the Industry Leadership Award recognizes Reuss for his deep commitment to revitalizing his hometown of Detroit through educational, community, and philanthropic endeavors. Among other things, he oversaw the purchase of the historic Durant-Dort Factory One, the birthplace of General Motors, in 2013. After extensive renovations, Factory One reopened in 2017 as a modern, world-class facility that hosts events and holds the iconic Kettering University automotive archives.

### Past Industry Leadership Award winners

- 2020 Mark Reuss, General Motors
  - 2019 Roger Penske – Penske Corp.
  - 2018 Josè Muñoz – Nissan Motor Company, Ltd.
  - 2017 Jack Roush – Roush Enterprises
  - 2016 Mark Fields – Ford Motor Company
  - 2015 Sergio Marchionne – Fiat Chrysler Automobiles
  - 2014 Osamu (Simon) Nagata – Toyota
  - 2013 Mary T. Barra – General Motors
  - 2012 Edsel B. Ford II – Ford
  - \*2011 John Krafcik – Hyundai
  - \*2011 Peter Marks – Bosch
  - 2010 Rodney O'Neal – Delphi
  - 2009 Jim Press – Chrysler
  - 2008 Alan Mulally – Ford
  - 2007 Carlos Ghosn – Nissan
  - 2006 Robert A. Lutz – General Motors
  - 2005 Dr. Shoichiro Toyoda – Toyota
  - 2004 J.T. Battenberg III – Delphi
  - 2003 Gary L. Cowger – General Motors
  - 2002 Heinz C. Prechter – ASC Inc.
  - 2001 Shamel T. Rushwin – Ford
  - 2000 Donald E. Hackworth – General Motors
  - 1999 James J. Padilla – Ford
  - 1998 Dennis K. Pawley – Chrysler
  - 1997 G. Richard Wagoner, Jr. – General Motors
- \*Co-winner

## DOSSIER: Jennifer Morrison of Mazda

Jennifer Morrison is a woman on the go. The Manager of Vehicle Safety and Compliance at Mazda North American Operations is on her second round of night school. Specifically, she is working toward a master's degree in organizational leadership and development at Saint Joseph's University.

"Night school again," she told *Update*. "This time to figure out how people work together to assemble and lead successful organizations. Spoiler alert: Rebuilding a transmission is much easier than understanding human interaction."

Her path to master's degree night school started with a bachelor's degree in bioengineering from Penn. Then it was on to her first job, in Washington, DC. "But shortly after starting, I had the itch to get more hands-on experience around cars and completed a degree in applied automotive science at Montgomery College," she said. "It was essentially night school to become a certified automotive technician, and it was one of my favorite educational experiences."

Prior to joining Mazda just over a year ago, Morrison was an investigator for the National Transportation Safety Board for 16 years. "For most of that time, I served as a Vehicle Factors Engineer on a go-team that deployed to high-profile highway crashes all over the US. My job was to assess the



**Jennifer Morrison making a presentation at SAE COMVEC in 2015.**

mechanical condition of the vehicles involved to see if it had a role in the crash. I then led a team as their Investigator-in-Charge. It was both an intense and fulfilling experience. I worked with some of the best people in some of the worst of circumstances. Standing on those crash sites shook me, and shaped me into the safety advocate that I am today."

Now, as Manager of Vehicle Safety and Compliance at Mazda North American Operations, she oversees all aspects of Mazda's compliance to Federal Motor Vehicle Safety Regulations. "It involves

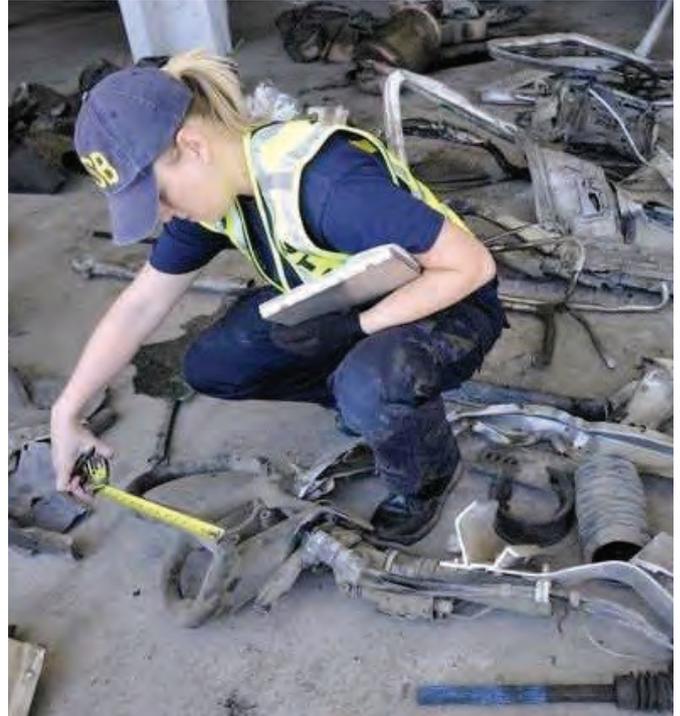
everything from annual reporting of vehicle specifications to making sure that new designs don't conflict with the rules set for all U.S. passenger cars," she said. "I also get to manage the safety ratings of Mazda vehicles by the U.S. government and consumer groups such as the Insurance Institute for Highway Safety and *Consumer Reports*. Today's safety ratings involve a series of tests to assess occupant injury in the event of a crash. They also include tests of our crash-avoidance systems, such as automatic emergency braking. It's been really rewarding to see Mazda earn five-star ratings and Top Safety Pick Plus awards.

"Now I'm looking to learn more about the behavioral side of science and am about halfway through my master's at Saint Joseph's."

There's much more to the Jennifer Morrison story than that, however. Read the Q/A below.

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

The U.S. Department of Transportation just announced that the Partnership for Analytics Research in Traffic Safety (PARTS) will be entering Phase 2. Mazda is one of eight automotive manufacturers that have joined the partnership to share data and solve problems. The initiative is modeled after data sharing in the aviation industry and has so much potential to help us



**As an NTSB vehicle factors engineer, inspecting wreckage from a tractor-trailer and train collision in Miriam, Nevada in 2011.**

eliminate crashes by developing systems laser-focused at preventing them.

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

I'd have to say the mid-career transition that I made at the end of 2018. It took a lot of courage to leave a stable government job that I loved for the unknown of the private sector. The whole idea seemed crazy at first, but I'm incredibly proud of myself for staring uncertainty in the face and taking the leap despite my doubts. The decision has really paid off. It feels as if fresh air has been breathed into my career as I take on new challenges.



**With SAE DC Section Board Members and her sons at an SAE Student Showcase at the University of Maryland.**

### **In what way is SAE International helpful to you in your job?**

SAE helps me stay in touch with many of the people that I need to communicate with professionally. This typically occurs during the planning and carry-out of the annual SAE Government Industry Meeting. The event creates a unique opportunity for automakers and suppliers to interact with government policy officials on topics affecting vehicle safety.

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

I've been an SAE Member since 2006. But I

really started to get involved after attending a tour of XM Radio that the SAE Washington DC Section organized. I truly enjoyed learning about a field different than the one I was in and socializing with other engineers. From there I was hooked to SAE Washington DC Section events. I eventually took a position on the DC Section Board as Secretary, then Vice Chair, and I am now Chair.

### **In what way has SAE Membership been most beneficial to you?**

The leadership opportunities within the SAE Washington DC Section have shown me a

different side of work and business. I've gained a clear understanding of the importance of human interactions. It's easy to create opportunity and fuel ambition, or erase both, just in the way you interact with people. This is true of everything we do in personal life and career. I've learned to be a better listener and appreciate the differences in people.

Another big benefit of being involved with SAE is interaction with students—particularly those studying automotive engineering. Every once in a while I will get an email from an engineering student looking to get their first job. Those messages are always worth my time to pause and reply. I see it as a critical responsibility to be an open sounding board to young engineers.

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

Dan Ryan was the SAE Washington DC Section Chair at a critical time during my involvement. He encouraged new members to join the board and put together events that people really wanted to attend. Coincidentally, he's also the Vice President of Government and Public Affairs for Mazda. Knowing that he had happily been with Mazda for many years made my decision to join the company that much easier.



**As an NTSB Investigator-in-Charge, delivering a press briefing after a fatal bus crash in Baltimore, Md., in 2017.**

### **How can current and prospective SAE Members get the most out of their SAE membership?**

Get involved in your local section! Or at least attend their events. The local sections host fun events and give back to student groups. That's where the real benefit is, in interacting face to face with people who have similar interests and being part of the network that prepares the next generation of engineers.

### **What do you do in your free time?**

I wouldn't call any of my time free, but it is always well spent. In addition to my career, I also hold the titles of mother, wife, friend, homeowner, cat/dog/fish owner, and student. I stay busy and laugh a lot—often at



Photos from Morrison's first year at Mazda, "which included a lot of test drives and my first trip to Japan."

myself. And often in the company of good friends. I try to enjoy every moment with my young sons, even when one has the other in a headlock. And above all, I am grateful for the people and places that surround me.

**Is there anything else about yourself that you'd like to share with Update readers?**

I'm originally from Iowa. A small town in the southeast corner. I knew I wanted to be an engineer since I was about 12 or 13. My

father was a machinist for the railroad and my mother was a factory worker. So blue-collar, hands-on jobs are in my DNA. But I wanted to put a different spin on it. My spin would have to have something to do with cars, which I became drawn to mostly out of necessity. In rural Iowa, having a car meant having freedom. It all started with the thought, "if I could only get that old beater in the driveway to run..." And now here I am. ■

## Farewells

News of the following deaths has reached SAE International.

Terrence Dovre, 50 years of SAE Membership

Duncan MacLaren, 55 years of SAE Membership

Dan Paisley, 42 years of SAE Membership.

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| Employers   | Job Seekers  | Jobs      | Resumes/CVs |

## SAE Chicago Section sells out recent event



**Blackdog's Ray Sorenson gives a presentation to SAE Chicago Section members.**

Calendar year 2020 got off to a strong start for the SAE Chicago Section with a sold-out event at racing performance company Blackdog Speed Shop in Lincolnshire, Ill, on January 21. In all, 51 people attended, including six university students, according to Section Chair Timothy M. Hicks, P.E., Principal Engineer / Mechanical, Professional Analysis and Consulting, Inc.

After a brief presentation by Blackdog, tours were given of the shop, including its performance car division and its GT4 racing team. A lot of the work Blackdog does is custom, and often “a lot of engineering goes into a project,” according to the company. A highlight of the tour was Blackdog’s “shop car,” a 2018 ZL1 Camaro, being run on the shop’s full-vehicle dynamometer. The car is dubbed ZL-11 due



The presenters from Blackdog were (left to right) Ray Sorenson, Regis Coudrier, and Tim Williams.

to its 1,111 rear-wheel horsepower on good fuel. Click [here](#) to see a video of the section event at Blackdog.

The shop houses two World Challenge GTS racecars, five championship trophies, several state-of-the-art street rods, powerful modern street machines, and all of the high-tech equipment to build them all.

“This was one of our more successful events,” Hicks, who is in his third year as

Chicago Section Chair, told *Update*. “Having had an event just before the holidays with close to 60 attendees, we were afraid of the number of registrations for mid-January, in addition to potential Chicago weather issues. Due to the subject matter, intriguing company, and aggressive marketing, we considered the Blackdog Speed Shop event to be an overall success.” ■

# 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!

### [REVISITING 19TH CENTURY IDEAS FOR 21ST CENTURY APPLICATIONS](#)

Laurence Evans writes, “There have been a number of ideas from past centuries that were abandoned, often due to the convenient availability of cheap fossil fuels, but have seen a resurgence. EVs were popular in the late 1800s/Early 1900s. Henry Ford’s early cars ran on ethanol. Wind power was used to mill grain and pump water for centuries... So, what other ideas from over a century ago do you think could use another look? – Add your voice [here](#).

### [LOW SPEED PRE IGNITION AND ENGINE OIL](#)

In answer to a question from Trevor Bridges about piston cracking, Stephen Swedberg writes, “Use high octane fuel and lower ash content engine oils to alleviate LSPI. The oils still must meet API’s SN PLUS category to be acceptable to the OEM.” – Add your voice [here](#).

## Member Connection Chat with the Expert series

The Chat series is a two-day session in Member Connection with a subject matter expert on a particular technical topic, or on the topic of workforce development. The subject of the next chat is “Women in Leadership,” including authors of the book “The Road to the Top is Not on the Map: Conversations with Top Women of the Automotive Industry” as well as other women leaders involved with SAE. Join the March 19-20 chat [here](#). Experts to date include Elizabeth Griffith, Director of Engineering and Program Quality—GM Interior Systems; Elizabeth Champion, Director of Engineering, PTI; Amalia Batori, Director of Sales, Robert Bosch LLC; and Kinsey Olson Sovern, Chair, SAE Dayton Section.

## SAE Mentor Program

### Featured Mentor:

Elizabeth Champion

Temro Industries



Elizabeth Champion is the Director of Engineering at Phillips and Temro Industries in Minneapolis, Minn. The company provides thermal and electrical solutions for the mobility industry, including automotive, heavy duty trucks, and off-road.

She been a member of SAE since her time at Central Michigan University, while obtaining her BSME and participating on the Baja SAE team.

“Now, I support the SAE Twin Cities Section by participating on the Board,” she told *Update*. “I started my automotive career several years ago working at FCA as a design release engineer. That role gave me great exposure to the automotive community and the benefits of having mentors—and, specifically, a support group of women engineers.”

“As my career progressed,” she continued, “I realized I could give back to our community by mentoring and advocating for women in our industry. I started to take a more active role after I decided to start a family. The struggles I ran into after making this decision reminded me of some research when completing my master’s. At that time, it was something like a quarter of women leave engineering (not the workforce) after the age of 30.

“Since then, I remind myself of how my actions are represented to women in my department and other women that aspire to be leaders in our organization.”

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

## What’s New

### Student and Young Professional Tech Paper Competition

Students and young professionals (34 and under) are invited to submit abstracts for the SAE Student/YP Technical Paper Competition by March 30, 2020 in MyTechZone, in the following areas: Advanced Propulsion, Automated/Autonomous and Connected Vehicles, or Urban Mobility and Smart Cities. The top two student and top two young professional papers will be published by SAE and receive an all-expenses paid trip to SAE Innovations in Mobility, September 2020 in Detroit, MI, to present their work. For more information, visit [sae.org/attend/calls-for-papers](https://sae.org/attend/calls-for-papers).

### Save on travel and car rentals

We know this is a busy time of year – Collegiate Design Series competitions, SAE’s flagship events, and spring break. SAE has partnered with several car rental companies (Hertz, Dollar, and Thrifty Car Rental) to save you money on your next road trip. We also have many opportunities to save on hotels through our Travel Savings Center. You need to get places, and you shouldn’t pay more than you have to. Go to [sae.org/membership/benefits](https://sae.org/membership/benefits) to get SAE Members-only codes and links for your savings.

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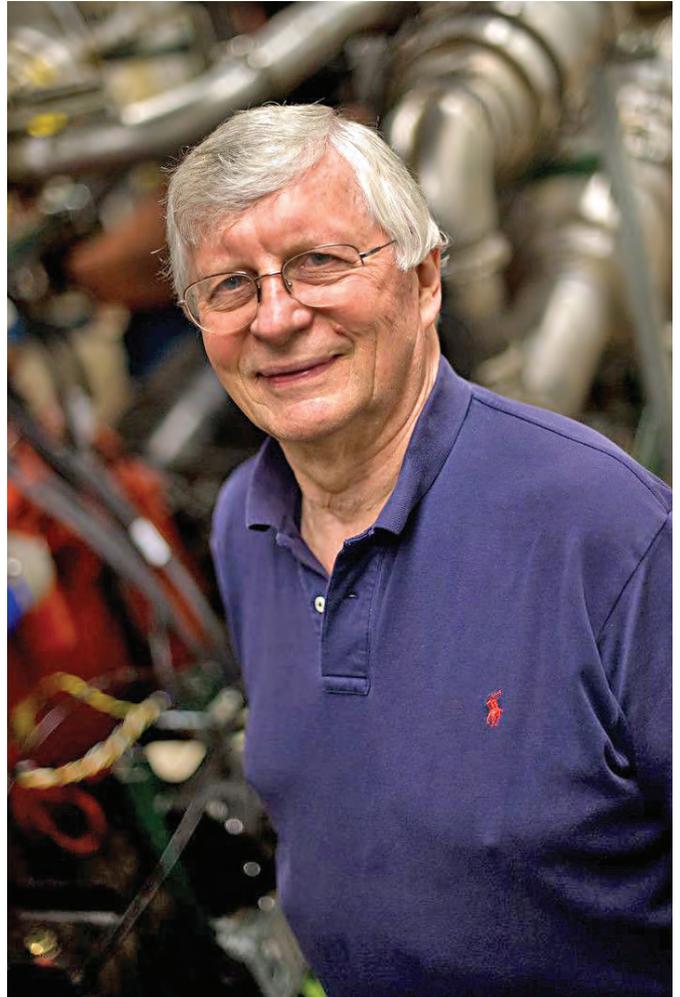
**Dr. Piotr Szymanski**  
Director for Energy, Transport  
& Climate, European  
Commission Joint Research  
Centre

## More focus needed on the “E” in STEM, SAE Fellow says

I wrote an ASEE PRISM article in January 2018 ([republished in Update, March 2018](#)) on the need to do a National Academies (NA) study on recommending policy and actions to increase the number of U.S. citizen Ph.D.s to work in U.S. National Laboratories, industry, and as faculty. I proposed that the study focus only on engineering—not STEM (science, technology, engineering, and mathematics), which is so popular now in terms of K-12 funding by the federal government and industry. I also had a [follow-up article](#) published in the July 2018 issue of *Update* outlining a strategy to increase M.S. degree engineering graduates, and in turn Ph.D. graduates, to work in government, industry, and as faculty.

Recently, a Government Accounting Office (GAO) Annual Duplication Report stated that the federal government runs more than 160 different programs to promote STEM education. All told, 13 different agencies have programs totaling \$2.9 billion in spending in a single year. GAO stated, “Nearly all of these programs overlapped with at least one other program.”

STEM has become a term used to raise funds, and the “E” for engineering has been lost. I want to expand on why more directed focus should be on engineering. Students



**SAE Fellow John H. Johnson wrote this article for *Update*. The Presidential Professor Emeritus at Michigan Technological University has served on a number of National Academies Committees.**

earning a B.S. degree in engineering can get very good-paying jobs—in the \$60,000-\$80,000 salary range, as I stated in the ASEE PRISM and *Update* article.

Engineering really encompasses study in science, mathematics, and engineering

science, and engineers are critical for designing and developing technology. Most engineering disciplines rely only on physics and chemistry fields of science in their undergraduate studies.

Engineering is a unique profession which is described in a 2018 National Academies study as “a dynamic discipline and practice that integrates and applies knowledge from various fields and draws on a broad and expanding portfolio of technical as well as professional skills, such as creativity and design, oral and written communication, teamwork and leadership, interdisciplinary thinking, business acumen and entrepreneurship, and multicultural understanding. Trained engineers use their knowledge and skills in a variety of occupations and industries and across all sectors of society.”

The STEM workforce, as defined in a recent NA study, includes, “science and engineering occupations (currently about 5.7 million people) and science and engineering-related occupations (currently about 7.4 million people; National Science Foundation, 2016).” These two groups of occupations have been carefully defined and studied by the NSF. In this definition, the science and engineering occupations include computer and mathematical scientists; biological, agricultural, and environmental life scientists; physical scientists (e.g., physicists, chemists,

geoscientists); social scientists (e.g., psychologists, economists, sociologists); engineers; and postsecondary teachers in science and engineering fields.

The science- and engineering-related occupations include health care workers (e.g., physicians, audiologists, nurses); science and engineering managers (e.g., engineering managers, natural and social science managers); science and engineering precollege teachers (e.g., K-12 science teachers); technologists and technicians in science and engineering; and other science and engineering-related occupations (e.g., actuaries, architects).

There are a large number of occupations included in the NSF STEM definition, and it is my opinion that engineering is a small fraction of them. Engineering—along with nursing, physical and occupational therapy, and accounting, for example—are unique in that they lead to good-paying, professional occupations for those with only a B.S. degree, and therefore students in engineering need to be actively recruited and funded if they are to be convinced to go into graduate programs. Also, many of the science jobs require an M.S. or a Ph.D. degree in order to practice in these occupations.

SAE International has for the past 25 years run a program called A World in Motion (AWIM) for primary, elementary, and middle school students that involves a teacher-led engineering design

experience supplemented by engineer professionals who volunteer to assist the teachers in implementing the program. For organizations that want to financially support STEM programs that focus on engineering, this is the approach that is needed.

There is now a need for organizations and individuals to financially support development of programs in K-12 that have a focus on engineering, with engineer professionals assisting the teachers, so that students become proficient in science and mathematics and pursue engineering as a profession.

Also, university graduate program funds are needed to increase graduate fellowship support, with goals and plans to recruit more U.S. citizens at the M.S. and Ph.D. degree levels. Technical societies and

universities need to extend their traditional fundraising support for undergraduate degree programs to additional graduate-level funds with a focus on recruiting U.S. citizens into the programs. And there is a need for K-12 programs and junior-senior undergraduate efforts in engineering degree programs to develop more domestic engineering graduate students.

There is also a need to focus on developing U.S. citizen Ph.D. engineering graduates that become faculty. Wouldn't it be a loss for the U.S. if we put all this effort to support STEM education for K-12 grades and to promote pursuit of engineering degrees among undergraduates, but end up not having engineering faculty to teach the next generation of B.S., M.S., and Ph.D. engineering graduates? ■



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## SAE Mobility History Committee wins award, plans 2020 activities



**SAE Mobility History Committee Chair Len Kata (second from left) poses with other winners of MotorCities National Heritage Area awards. An SAE Member since 1974, he retired in 2017 after a career spanning 44 years in government and the auto industry.**

After having won the MotorCities National Heritage Area Award of Excellence in the category of Interpretation & Education, the SAE Mobility History Committee (MHC) is preparing to host a display and activities at WCX 2020 SAE World Congress Experience in April.

The MotorCities award was presented to the committee as part of a ceremony celebrating the Sixth Annual Michigan Auto Heritage Day. The ceremony took place at

the Michigan State Capitol Rotunda in Lansing, Mich., in October 2019. The award was for “presenting the history of mobility in a relevant and engaging manner, encouraging research and scholarship of our mobility heritage,” said Len Kata, MHC Chair. Other awards were presented to different organizations and individuals in different categories. The MotorCities Award program is in its sixth year.

About the award, Kata told *Update*, “I



**Several members of the SAE Mobility History Committee attended the MotorCities National Heritage Area awards program. Shown here are (left to right): Bob Elton, MHC member; Keith Leigh-Monstevens; MHC member; Steve Rohde, MHC member; Elisa Guyton, Associate Development Director, Yankee Air Museum, with the Award of Excellence for Education/Interpretation; Leonard Kata, MHC Chair, holding a legislative tribute with Michigan State Sen. Mallory McMorrow of Royal Oak; and Brandie Schandelmeier, SAE International staff liaison to the MHC.**

wish to stress that it was a group effort, especially the project which was used as an example of MHC's work: donating to the Yankee Air Museum a scrapbook documenting a visit by Eddie Rickenbacker during World War II to the Willow Run bomber plant and Detroit.

The committee created an electronic version of the "long-forgotten" scrapbook, which depicted the famous World War I pilot's 1943 visit to the plant. The area was considered "the Arsenal of Democracy."

In addition to receiving the MotorCities Award, the committee was presented with a Certificate of Recognition signed by Padma Kuppa, State Representative, 41st District,

and a Special Tribute, presented and signed by Mallory McMorrow, State Senator, 13th District, also signed by Kuppa.

At WCX 2020, the MHC will have a display and three presentations in the event's Learning Lab venue. The theme is "The History of the Future: Mid-Engine Evolution." Said Kata: "We are planning on six to eight vehicles representing the evolution of mid-engine design from the 1900s to 2020, as well as posters and a looping video complementing the exhibit. The three presentations in the Learning Lab will include an explanation and video of our exhibit, a presentation on the history and alternatives of engine location, and the 2020 Corvette as

a modern mid-engine production vehicle.

"I should point out," Kata added, "that we utilize the talents of the MHC members to research the required historical information, source vehicles, prepare the literature, brochures, and posters, and produce the videos—all on a volunteer basis."

Some of the earliest motor vehicles were constructed as mid-engine vehicles, with the engine beneath the floor or front seat, ahead of the rear axle," Kata told *Update*. "Over time, front-engine, rear-wheel drive vehicles gained popularity, along with rear-engine, rear-wheel drive and front-engine,

front-wheel drive configurations. The WCX 2020 SAE Mobility History Committee exhibit will demonstrate how the mid-engine concept has existed from the earliest days of motoring through today."

In addition to WCX 2020, the SAE MHC is planning on a presence at Wings and Wheels at the Yankee Air Museum, Willow Run Airport, Ypsilanti, Mich., in June. Also planned is a presence at other transportation-related events, including the Motor Muster at The Henry Ford (Greenfield Village), Dearborn, Mich., featuring classic vehicles from 1933 to 1977. ■



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## Royal treatment in store for SAE Members and volunteers at WCX 2020

As its name implies, the SAE Membership and Volunteer Engagement Lounge at WCX World Congress Experience always has comfortable couches and chairs that members and volunteers can sink into for a bit of remove from the sensory overload that SAE International's largest annual automotive engineering conference and exhibition can bring on.

But it's so much more than a comfortable place to relax for a moment.

Several special lounge events are planned for WCX 2020 April 21-23. Among them are two presentations, one of which will focus on career advice for students and young professionals. The presenter will be someone considered by SAE as one of the most influential and inspiring young engineers in the automotive business, Maura Chmielowiec. The Design Release Engineer in the High Voltage Hardware & EVSE group at General Motors will speak from 1:00-2:00 p.m. on April 21.

A speaker to be selected later will make a presentation from 2:30-3:30 p.m. April 22 that will be part of a larger "Volunteer Engagement Party" focusing on the various ways SAE Members and nonmembers alike can advance SAE's mission on a volunteer basis. Snacks and give-aways will be offered.



**General Motors engineer Maura Chmielowiec was one of 48 individuals in SAE first Contributor of the Year class. She will make a presentation in the SAE Membership and Volunteer Engagement Lounge on April 21.**

A constant at the lounge throughout its three-day run will be the helpful hands and minds of the SAE Membership and Volunteer Engagement Team. These staff representatives will answer any question any visitor might have about how to get engaged with SAE. Staff will also be happy to introduce visitors to, or familiarize them with, [SAE Propel](#), the online system that matches one's volunteer ambitions to the most fitting volunteer opportunities.

"Participating in SAE activities can help an

individual achieve a personal or professional goal as well as contribute to the advancement of the mobility industry,” said Donna Edenhart, SAE International Director of Membership and Sections. “And so we will be eager to help visitors to the Membership and Volunteer Engagement Lounge explore the dozens of volunteer opportunities available to them via SAE Propel.”

In addition, the lounge will offer free coffee and snacks, and serve as a

comfortable venue for relaxation and networking. At the front desk of the lounge, don’t forget to pick up your member ribbon that makes you eligible for spot prizes throughout WCX week.

The lounge, located on the show floor, will have the following hours:

April 21 8:45 a.m.-4:30 p.m.

April 22 8:45 a.m.-4:30 p.m.

April 23 8:45 a.m.-2:00 p.m.

See page 32 for a WXC 2020 preview. ■

## SAE Gear Store opens its online doors



SAE International is making it easier for members and non-members alike in the U.S. to purchase SAE merchandise. Click [here](#) to view the selection, which includes apparel, drinkware and coolers, and office/technology items. No international shipments.

# At WCX 2020, SAE International to ‘Lead the Future of Mobility’

SAE International will again bring the [WCX World Congress Experience](#) to Detroit, gathering the mobility industry’s foremost engineers, executives, OEMs, suppliers, decision-makers, and disruptors for three days of interactive learning, expert insight, collaboration, and inspiration. WCX 2020 will be held from April 21-23, 2020, at the TCF Center (formerly Cobo Center) in Detroit.

Among the highlights will be the two opening keynote speakers, providing insights on the changing business model approaches in automotive and preparing an organization for success. Following the keynote presentations, the speakers will participate in an engaging conversation to answer questions from the audience.

Jeff DeGraff, business professor and author, Ross School of Business at the University of Michigan, will present *“When Technology Won’t Win the Innovation Race.”* Known as the “Dean of Innovation,” DeGraff teaches courses on leading creativity, innovation, and change. His research and writing focus on all facets of innovation, including strategy, change and competency development, creativity, leadership development, and community and network creation. He has authored a number of books focused on thought

leadership and innovation.

In his presentation, he will ask and then answer the question, “If we are transitioning to a new business model, then why won’t the first to master technology win the innovation race?” He will talk on the power of constructive conflict, value creation, and opinion diversity to show how successful companies look at developing culture, competency, and community. He will conclude on how better evaluation of where the market is going and finding the right cultural mindset can position automotive companies for success.

John Ellis, Founder and Managing Director, Ellis and Associates, formerly was the global technologist of Ford Motor Company’s connected car business unit. He was involved in developing Ford’s latest-generation connected car solution, the next generation of Sync services, and an API system for integrating mobile devices into the car. Additionally, Ellis co-designed and is the lead instructor of the Connected Vehicle Professional certificate course for SAE International.

His presentation is *“Ship-and-Forget to Ship-and-Remember: The Existential Question.”* The rise of connectivity in vehicles is at an all-time high. It is anticipated that the U.S. car park will be

more than 80% connected by 2025. Moreover, without software, the modern car is nothing more than an expensive paperweight. Ellis will explore how now, more than ever, the automotive industry is faced with the existential question: To change its business model from the historic Ship-and-Forget to Ship-and-Remember.

"WCX 2020 aims to 'Lead the Future of Mobility' and our keynotes will share their unique insights on innovation, strategy, change management, and what organizations need to do to prepare for the immediate and long-term future," said Dave Weil, Director of Engineering Events at SAE International. "WCX has long been regarded as the premier global automotive technical event, and we again are developing a technical program that will enable attendees to engage in thoughtful and spirited discussions that can ultimately drive innovation and solutions to solve the challenges organizations are facing now and in the future of mobility."

WCX 2020 will feature a look at the latest advancements in mobility technologies, including an autonomous drive demonstration, the Innovation Corridor, exhibits, and sessions on trends and innovations impacting the industry, and the finals of the [Global Automotive and Mobility Innovation Challenge \(GAMIC\)](#). Additionally, the event is further expanding its global footprint with an international



**Jeff DeGraff is business professor and author, Ross School of Business at the University of Michigan.**



**John Ellis is Founder and Managing Director, Ellis and Associates.**

pavilion that features global exhibitors from Korea, China, Israel, and Europe.

Nearly 9,000 technical experts, engineers, and business leaders convene for interactive learning, thought leadership, inspiring features, and technological innovation at WCX. Learn the latest consumer metrics, regulatory standards, and emerging research

and technology from SAE International, the leader in mobility standards.

“Content and the exchange of knowledge continue to be the cornerstone of WCX,” said SAE’s Gretchen Stokes, Event Manager.

Featuring more than 800 hours of technical content, WCX will dig deep into the most important topics in mobility technology—from blockchain and IoT to powertrain and safety—to prepare for the shift from automotive to mobility.

Special events at WCX 2020 include:

- Daily breakfast and receptions on the show floor.
- Women’s Panel and Networking Breakfast.
- WCX Gala, where the industry gathers to celebrate leaders and network in a relaxed setting. Guests enjoy food stations, cocktails, and entertainment while connecting with fellow industry players.

- Detroit SAE Section Vehicle Event (details to be announced later; free WCX registration for Detroit Section members on April 22)
- Automotive Women’s Alliance Foundation (AWAF) Speed Mentoring Lunch.
- Demo Days – Autonomous Drive featuring Dataspeed will demonstrate new technologies
- The new Beer Garden, featuring the Mopar Bar, where attendees and exhibitors can sample local brews and engage with peers.

To learn more about the program at this year’s WCX World Congress, visit [sae.org/attend/wcx](https://www.sae.org/attend/wcx).

SAE Members receive a discounted registration rate. To register, visit [sae.org/attend/wcx/registration](https://www.sae.org/attend/wcx/registration). ■



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- Small and Micro-Combined Heat and Power (CHP) Systems
- Two Stroke Technology
- Vehicle Dynamics & Safety
- Vehicle Components

## Professional Development short courses available before WCX 2020



By offering professional development short courses before WCX on April 18 and 19, SAE International is enabling attendees at WCX 2020 World Congress Experience to avoid missing any conference technical sessions while still being able to learn from leading experts in the field, in depth. Listed below are the course offerings.

### **Overview of Highly Automated Vehicles**

The course covers behavioral competencies such as autonomous braking, steering, and merging; reviews various sensors, and their strengths and weaknesses; and discusses the HAV software stack and how the various pieces work together to perceive the world and move through it.

### **ADAS Application: Automatic Emergency Braking**

This course provides an overview of an ADAS AEB system, the development cycle processes, system-level requirements, design architecture and considerations for a functional safety (ISO-26262) perspective, and a general overview of algorithm concepts.

### **Cybersecurity: An Introduction for the Automotive Sector**

This seminar introduces critical cybersecurity concepts and puts them in an automotive context. It cuts through to the “so what” basics that enable understanding and provides ideas to implement in your company.

## **The Role of Connected and Autonomous Vehicles in Smart Cities**

This course fills an unmet need for defining and explaining the relationship between connected and autonomous vehicles (CAVs) and smart city transportation.

## **Accident Reconstruction, the Autonomous Vehicle and ADAS**

After the crash, you need to know if an autonomous or driver assistance system was installed in the vehicle, if it functioned properly, and if it affected the outcome of the accident. Get a detailed look at the rapidly growing field of self-driving vehicles and driver assistance systems.

## **Applying Automotive EDR Data to Traffic Crash Reconstruction**

This course provides the skills needed to analyze imaged EDR data, apply it to crash reconstruction, reconcile it with calculations from data sources, and analyze EDR data set without regard to manufacturer. Also addressed is how to present data in the courtroom.

## **Engineering Project Management**

Increase your project management and APQP knowledge and skills in this easy-to-understand format. Teams will work a sample project through all phases of the project plan using industry-based documents encountering real issues,

problems, and constraints.

## **Fundamentals and Applications of Electric Motors for Automotive Industries**

Did you know some electric vehicles have more than 60 electric motors in them? Get an introduction to the fundamental physics-based principles of electric motors so you are equipped with a working knowledge to address design challenges.

## **Introduction to Brake Control Systems: ABS, TCS, and ESC**

This comprehensive seminar introduces participants to the system-level design considerations, vehicle interface requirements, and inevitable performance compromises that must be addressed when implementing these technologies.

Please join us to learn more about other topics, such as LIDAR, OBS Systems, Accident Reconstruction, NVH, and more. If you're looking to sharpen your skills in any of the topics listed above, use the link below to register now!

[sae.org/attend/wcx/program/professional-development](https://www.sae.org/attend/wcx/program/professional-development). ■

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Warren, MI, General Motors. Perform, debug, & validate mapping & localization features for level2 autonomous & semi-autonomous psgr vehicles. Create, debug & test in house tools, libraries & SW in C/C++ & Python languages, using MATLAB & Simulink tools, incldg build syss, libraries, algorithms, & frameworks, in Linux & Windows, to ensure safe functioning of safety critical autonomous vehicles incldg LIDAR, RADAR, high precision cameras, & Inertial Measurement Unit (IMU) sensors. Dvlp tools to compare HighDef map data with Med.Def. maps & generate bias metrics to measure performance of autonomous vehicle. Work on complex problems involving Coordinate Transformations, Object Perception (incldg images, point clouds, segmentation, & registration), Mapping & Localization, Path Plng, Obstacle Avoidance, Object Tracking, & Vehicle Control incldg validation of map database. Use Agile dvlpmt utilizing code repository, code review, work & issue tracking tools incldg Git, Gerrit, Jenkins, Bitbucket, & IBM RTC/DOORS NG tools. Master, Electrical Engrg, Computer, Control Syss Engrg, or related. 12 mos exp as Engineer, creating & testing inhouse tools & SW in C/C++ & Python languages, using MATLAB & Simulink tools, incldg algorithms & frameworks, in Linux & Windows, to ensure safe functioning of safety critical autonomous vehicles incldg LIDAR, RADAR, high precision cameras, & IMU sensors, or related. Mail resume to Ref#2605-204, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

### **QUALITY ENGINEER, HANCHETT ENTRY SYSTEMS,**

Phoenix, AZ. Analyze & ensure final products comply w/ ASSA ABLOY qly standards, applying qly assurance & lean mfg techniques, to reduce scrap rates, production lost time & return material authorization (RMA) during high volume electromechanical mfg plant production of electric strikes, access control cmpnts, electronic locking syss, cabinet locks, electromagnetic locks, exit bars & power supplies. Use Oracle JDE ERP sys, & Thrive & QlikView tools, & collect & analyze qly metrics incldg customer returns, scrap percentage, qly audits results, production lost time due to qly issues & first pass yield results, & distribute results to production, R&D, custmr service & mgmt. Recommend design enhancements w/in engrg & cost parameters. facilitate qly & process efficiency. Assist w/ product testing, evaluate & assure product compliance w/ UL, EUCB & Builders Hardware Manufacturers Assoc. reqmts incldg ANSI/BHMA A156.23-2010- American Natl Standard for Electromagnetic Locks. Monitor total cost of poor qly incldg rework, scrap, & RMA of non-conforming cmpnts & finished goods. Bachelor, Industrial, Mechanical, Manufacturing Engrg, or related. 12 mos exp as Engineer, collecting & analyzing qly metrics incldg customer returns, scrap percentage & production lost time, & monitoring total cost of electromagnetic component or medical device poor qly incldg rework, scrap, & RMA of all non-conforming components & finished goods, or related. Mail resume to Ref#7703, Human Resources, Hanchett Entry Systems Inc., 10027 S. 51st St., Ste 102, Phoenix AZ 85044.

## JOB OPPORTUNITIES

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**TOOLING ENGINEER**, Brose North America, Auburn Hills, MI. Engr, dvlp, calculate piece & tool price, & improve tooling, eqpmnt, fixtures & gauges for Brose cold rolled & fine blanking, high strength steel & aluminum psgr vehicle door, seat & latch syss sheetmetal cmpnts to be assembled in high volume mechatronic component mfg plants & for effective utilization of personnel, material, machines & facilities. Assure high volume manufacture of cmpnts incldg seat, door & latch syss structures incldg stamped sheetmetal parts incldg seat back panels, side members, seat pans, & recliner cmpnts; door frames; & latch sys cmpnts. Improve, assure & validate stampings Design for Mfg/Assy of production presses tandem, transfer, & progressive presses (incldg blanking, forming, & trimming operations) for cold rolled, high strength steel, aluminum mfg processes. Assure compliance w/ formability & die engrg standard work procedures, using DynaForm & FastBlank tools. Bachelor, Mechanical or Automotive Engrg. 24 mos exp as Engineer or related, engrg, dvlpg, calculating tool price & improving tooling & eqpmnt for cold rolled & fine blanking psgr vehicle door or seat syss sheetmetal cmpnts to be assembled in high volume component mfg plant, & for effective utilization of personnel, material, machines & facilities, or related. Mail resume to Ref#542-84, Human Resources, 3933 Automation Ave, Auburn Hills, MI 48326.

**QUALITY CHAIN LEAD**, Warren, MI, General Motors. Review & analyze Voice of Customer field warranty data in Global Analysis Reporting Tool sys, NHTSA Transportation Recall Enhancement, Accountability & Documentation Act data & Safety Field Investigations process data, & evaluate/prevent defects in electrical syss in complete psgr vehicle Power & Signal Distribution Syss (PSDS) electrical syss incldg wiring harnesses, bussed electrical centers (BECs), & cmpnts, & related Active Safety syss incldg External Object Calculation / Front Camera / Body Control / Electronic Brake Control / Electronic Power Steering Modules; Charging Systems (generators, alternators, & 12V batteries); & passive safety syss (airbag modules), using Teamcenter Vismockup & E-2 tools. Coach & facilitate product & process engrg solutions to improve electrical syss designs & process qty methods, & improve product designs & BOMs of material reqmts. Bachelor, Electrical, Mechanical, Industrial, or Automotive Engrg. 24 mos exp as Engineer, Engrg Team Leader, or related, designing & releasing gasoline & hybrid electric complete psgr vehicle PSDS electrical syss incldg wiring harnesses, BECs, & cmpnts, or related. Mail resume to Ref#1618, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**DESIGN RELEASE ENGINEER**, Warren, MI, General Motors. Engr, dvlp, & release U.S., global & emerging market psgr vehicle exterior syss incldg fascias, grilles, bumpers, impact beams, bumper beams, lighting, exterior trim (rocker & side door moldings & appliques), wheel house liners incldg acoustics pads & textiles, roof racks, badges & nameplates, spoilers, weatherstrips, 360 degree cameras, front & rear part assist sensors, & handsfree liftgates, using UGNX, Teamcenter, Vismockup, & E2 tools. Perform anlysis, early stage design engrg, dvlpmt, benchmarking, & provide collaboration to ensure part performance meeting mass, cost & timing for U.S., global & emerging markets. Work w/ Design Studio to incorporate technologies to dvlp new designs for vehicle exterior syss starting w/ "clean sheet of paper" & engrg sys solutions to detailed & balanced level. Collaborate daily w/ Sys Integration & Chassis Engrs, & with Design, Mfg, Body, Powertrain, & Electrical to jointly dvlp overall optimal vehicle syss solutions. Master, Mechanical, Automotive, or Industrial Engrg, Technology Mgmt, or related. 12 mos exp as Engineer, engrg & releasing U.S. & global psgr vehicle exterior syss incldg fascia, grille, beam, 360 degree camera, & part assist sensor, using UGNX, Teamcenter, & E2 tools. Mail resume to Ref#30753, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**PROGRAM SYSTEMS ENGINEER—INLINE GASOLINE ENGINES**, Warren, MI, General Motors. Engr & dvlp Cylinder Set Strategy 1.5 liter 4 inline cylinder gasoline engines using Design for Mfg./Assy (DFM/DFA) principles, for implementation at engine plants in U.S., Mex & Chn. Execute deliverables for launch incldg product content definition & milestone gate reviews. Review early & Beta level released 2D part prints in Teamcenter & identify GD&T specs & gen. reqmts for machined inline nodular cast iron engine crankshaft, cylinder head & engine block features according to ASME standard Y14.5 (form, orientation, position, profile & runout), & create process sheet, gauge & cutting tool designs, & inputs for PFMEA. Identify milestone dates for Product & Process Design Reviews when engine design iterations are due for review & approval, & plan virtual builds, assessments & engine tests to solve DFM/DFA issues. Master, Mechanical Engrg, Mfg Systems, Mfg Engrg, Automotive Systems Engrg, or related. 24 mos exp as Engr, reviewing early & Beta level released 2D part prints, identifying GD&T specs & gen. reqmts for machined nodular cast iron engine crankshaft, cylinder head or engine block features according to ASME Y14.5 standard, & creating process sheet, gauge & cutting tool designs for PFMEA, or related. Mail resume to Ref#3699, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

## JOB OPPORTUNITIES

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**PRE-PRODUCTION LAUNCH MANAGER**, Warren, MI, General Motors. Lead & coordinate engrg, mfg, validation, qlty, & supply chain efforts to ensure successful component integration & launches of integration vehicles to support flawless full vehicle launches at U.S. & global vehicle assy plants. Analyze, coordinate daily/wkly/mnthly mtngs, & assure & verify mfg engrg processes, tools, new Body in White (BIW), powertrain & electrical modules parts, & ergonomics, during Pre-Production (PP) cmpnt & vehicle prototyping & launch phases at PP Ops in Warren. Prepare PP launch key indicator reports reflecting owners of launch deliverables in BIW, Paint & GA Depts., & define global & emerging market full psgr vehicle content, wire frame construction, engine dyno kit & frame, vehicle quantities, BIW, powertrain, chassis, thermal, interior & exterior specs, & overall buildability of vehicle content incldg ~1,000 part nos. Plan & ensure overall vehicle program qlty of BIW, Paint & GA depts, assembling psgr vehicles, & mentor/act as checkpoint for Production Group Leaders to contain defects & resolve problems & grievances w/ union reps. 2 years' exp as Production Group Leader, Production Supervisor, or related, supervising or leading Body in White, Paint or GA dept to ensure overall qlty of dept at high volume vehicle assy plant, & mentoring Production Group Leaders or Production Supvs to contain defects & resolve problems & grievances w/ union representative, or related. Mail resume to Ref#4518, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

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**VALIDATION ENGINEER-SPEECH RECOGNITION (SR)**, Warren, MI, General Motors. Test & validate commn between ECUs in infotainment sys, using commn protocols incldg MOST, CAN & Ethernet to improve speech recognition. Dvlp & maintain automation tools & automated mgmt reports in VB & Android-based apps using Java. Validate, debug, & improve infotainment features incldg radio reception; Bluetooth connectivity; Wi-Fi connectivity; navigation; audio arbitration; SR features; Center Stack Module, Instrument Panel Cluster & Body Control Module Human Machine Interface (HMI) modules; & 3rd-party internet virtual assist. apps improving SR. Dvlp & improve SR tests procedures & evaluate uttered sentences confidence levels based on live Speech Nuance logging. Use HW interface tools such as OptoLyzer, VehicleSpy, CANoe, RAD-Star/R-S2, & RAD-Moon, Tera term-serial board interface, & ADB. Bachelor, Electrical, Mechatronics, or Mechanical Engrg. 6 mos exp as Engr, validating infotainment features incldg Bluetooth/Wi-Fi connectivity, navigation, audio arbitration, SR features, & HMI modules, improving SR, & sys level reqmts, or related. Mail resume to Ref#4164, GM Global Mobility, 300 Renaissance Center, MC:482-C32-D44, Detroit, MI 48265.

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**DESIGN RELEASE ENGINEER-LOW RADIOS**, Warren, MI, General Motors. Engr, dvlp, improve HMI, & release psgr vehicle infotainment sys incldg low radios, touchscreen displays & button assemblies in Center Stack Module (CSM), using Teamcenter, VehicleSpy, IBM RTC, & E-2 tools. Integrate & validate radio software to verify compatibility with Body/Electronic Climate Control / Telematics Communication Protocol & Video Bypass Modules, IP Cluster, Park Assist & power lift gate features, & rear vision cameras. Ensure sys performance in compliance w/ FMVSS safety standards for fault detection mechanism. Support production validation phase of infotainment sys, considering stability & durability of product during Development Validation & Production Validation phases. Analyze captured CAN bus communication logs of vehicle subsystem ECU reprogramming & vehicle features & reading DTCs over CAN using VehicleSpy. Master, Electrical or Mechanical Engrg. 12 mos exp as Engineer, dvlp psgr vehicle infotainment sys incldg low radios, touchscreen displays & button assemblies in CSM, using VehicleSpy & E-2 tools, or related. Mail resume to Ref#1248, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

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**SIMULTANEOUS & FORMABILITY ENGINEER**, Warren, MI, General Motors. Engr, perform, execute early mfg feasibility studies to provide manufacturability assessments, & release preliminary die processes & layouts for high volume manufacture of U.S., global & emerging market psgr vehicle Body on Frame (BoF) & Body Frame Integral (BFI) stamped steel & aluminum body side outers, underbody & upper structures, roofs, hoods, liftgates, decklids & doors, at all virtual assessment gates to optimize mfg conditions & identify manufacturability concerns according to GM reqmts, using NX, Teamcenter, Vismockup, Autoform, DYNIFORM, PAM-STAMP, & LS-DYNA tools. Engr, design, & dvlp preliminary Die Operation Line-Up to determine number of workstations, flow direction, die sequence, & die processes such as draw, trim, pierce, flanging, restrike & cam dies required to produce complete part, applying knowledge of forming processes, die design, die mfg, die try-out (splits, wrinkles, surface defects), GD&T principles, press & stamping plant equipment capability to reduce number of dies, increase throughput, & meet cmpnt qlty reqmts incldg Class A surfaces. Bachelor, Mechanical or Material Engrg, or related. 24 mos exp as Engineer, engrg or releasing preliminary die processes & layouts for high volume manufacture of BoF & BFI stamped steel & aluminum body side outers, structures, roofs, liftgates, & doors, at all virtual assessment gates, using NX, Teamcenter, Autoform, & LS-DYNA tools, or related. Mail resume to Ref#34279, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

## JOB OPPORTUNITIES

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**COMPARTMENT MANUFACTURING ENGINEER**, Warren, MI, General Motors. Ensure new full vehicle &interior &exterior component product designs are manufacturable &in compliance w/ mfg reqmts &General Assy(GA) strategies for installation of exterior trim components (fascias, bumpers, windshields, front lamps, rear lamps, windshield wipers, emblems, body side moldings, insulators, roof racks &spoilers) &interior trim components (IP, floor console, seats, safety belts, overhead syss, roof rail air bags &floor coverings, for installation in high volume vehicle assy plant environment. Perform GA mfg planning studies (MPSs) for new psgr vehicles, model year changes, production volume changes, Engrg Work Orders (EWOs), &implementation of new standards of machinery &equipment &updates to Builds of Process. Conduct Teamcenter Vismockup virtual studies &assessments of tooling &eqpmnt throughout vehicle dvlpmt process. Bachelor, Mechanical, Automotive, Mechatronics, or Industrial Engrg. 12 mos exp as Mfg Engr or Process Engr, performing GA vehicle assy or stamping plant MPSs for new psgr vehicles, model year changes, production volume changes, EWOs, &implementation of new standards of machinery &equipment &updates to Builds of Process, or related. Mail resume to Ref#2889, GM Global Mobility, 300 Ren. Center, MC:482-C32-C66, Detroit, MI 48265.

**SCULPTING GROUP MANAGER**, Warren, MI, General Motors. Plan &lead advanced digital surfacing concepts &dvlpmt of Class A surfaces of full vehicle interior syss for 3-5 revolving concept &production psgr vehicle design prgrms for U.S., global &China markets. Lead team of Lead &Creative Digital Sculptors to interpret &define design intent of Creative Designers, while collaborating w/ engrg, packaging, human factors, &tooling teams. Kick off projects, perform &manage design &dvlpmt of 3D Class A surfaces, of Internal Combustion (IC) &full electric full psgr vehicle interior syss &cmpnts incldg instrmnt panels (IPs), door trim, consoles, headliners, A/B/C/D pillars, garnish &trim, trunk covers &detailed interior cmpnts incldg Head Up Display covers, air vents, defrosters, latches, handles &switches, using Alias AutoStudio, Maya, UGNX &VRED, for U.S., global &China markets. Bachelor, Industrial or Transportation Design, Mechanical Engrg, or related. 24 mos exp as Clay or Digital Sculpting Manager or Clay or Digital Creative Sculpting Manager, managing or leading team of Sculptors, &managing design &dvlpmt of 3D Class A surfaces of IC &full electric full psgr vehicle interior syss &cmpnts incldg IPs, door trim, consoles, headliners, A/B/C/D pillars, garnish &trim, for global or China markets, or related. Mail resume to Ref#48358, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**MANAGER-WASTE ELIMINATION &CONTINUOUS IMPROVEMENT**, Warren, MI, General Motors. Define &improve current U.S./CAN/MEX Outbound Vehicle Logistics Network (supply chain) incldg finished vehicle assy plant yard flow incldg vehicle storage &inventory control; delivery of finished vehicles from vehicle assy plants to ports, plants to dealers, &from ports to dealers, to reduce cost of delivery (eliminate waste), inventory in logistics pipeline, &transportation damage, &to improve GM to dealer service level. Dvlp Statement of Requirements, plan, dvlp, &deploy new vehicle Global Logistics Integrated Design &Execution logistics bus. model using Oracle Transportation Mgmt Sys tool incldg organizational capability, business processes, logistics network &leverage OnStar telematics &Cloud based technologies. Lead team w/ Waste Elimination &Continuous Improvement Logistics Analysts &Vehicle Logistics Sr Financial Analyst. Bachelor, Ind. Engrg, Production Engrg, Supply Chain, or related. 12 mos exp as Outbound Logistics Mgr or Outbound Supply Chain Mgr, managing &improving OEM vehicle maker Country or Region Outbound Vehicle Logistics Network (supply chain) incldg finished vehicle assy plant yard flow, vehicle storage &inventory control; delivery of finished vehicles from vehicle assy plants to ports, plants to dealers, &from ports to dealers, to reduce cost of delivery (eliminate waste), or related. Mail resume to Ref#1492, GM Global Mobility, 300 Renaissance Center, MC:482-C32-C66, Detroit, MI 48265.

**NAVIGATION TEST &VALIDATION ENGINEER**, Milford, MI, General Motors. Engr, test &validate psgr vehicle embedded navigation syss incldg Vehicle to Backoffice backend test procedures, to provide onboard/offboard navigation, Supercruise location, personalization, Apple Car Play &Android Auto, in vehicle &on test bench, using VehicleSpy, CANalyzer, CANoe, ATT, OnStar Global Simulator, TFS, DOORS, RQM, &DPS tools &neoVI FIRE/FIRE2, &RAD-Galaxy HW. Validate E2E sys performance of navigation, emergency crash &blue button service, &evaluation of data incldg location, antenna to Telematics Communication Platform (TCP) module, TCP to CAN bus &Automotive Ethernet, &CAN bus to Center Stack Module. Ensure navigation features &interactions are functioning per designed reqmts &specs. Bachelor, Electrical Engrg, Electronics &Communication Engrg, or related. 12 mos exp as Engineer, testing &validating psgr vehicle navigation sys, to provide onboard/offboard navigation, personalization, Apple Car Play &Android Auto, in vehicle &on test bench, using VehicleSpy, CANalyzer, ATT, &DOORS tools &neoVI FIRE HW, or related. Mail resume to Ref#27444-102, GM Global Mobility, 300 Ren. Center, MC:482-C32-C66, Detroit, MI 48265.

## JOB OPPORTUNITIES

**PERFORMANCE ENGINEER**, Milford, MI, General Motors. Engr, dvlp, test on test bench, validate, debug, & execute conventional & semi-autonomous psgr vehicle safety critical features (w/ sensor-based detection cameras &/or Radar) incldg SuperCruise Lane Centering Control (LCC), Full Speed Adaptive Cruise Control (FSRACC), regular Cruise Control, Lane Change on Demand, Lane Keep Assist, Advanced Park Assist, Park Assist, Rear Virtual Bumper, Automatic Front Sensing Braking, & Night Vision System features, using VehicleSpy, INCA, MATLAB, Simulink, CANalyzer, CANoe, DOORS, Synergy, E-2, & DPS tools, in CAN, CAN Flexible Data & Ethernet protocols, & neoVI FIRE 2 & RAD-Galaxy HW. Perform diagnostic check on vehicles to verify proper functionality of feature-in-test. Verify vehicle diagnostic content such as Diagnostic/Parameter/&Control Parameter ID to ensure feature functionality. Check VCRI, map performance & functional behavior reqmts, & validate functional safety reqmts. Master, Electrical, Computer Engr, or related. 12 mos exp as Engineer, engrg & validating psgr vehicle safety critical features (w/ sensor-based detection cameras or Radar) incldg LCC & FSRACC features, using VehicleSpy, INCA, & Simulink tools, in CAN protocol, & neoVI FIRE HW, or related. Mail resume to Ref#24467-108, GM Global Mobility, 300 Ren. Center, MC:482-C32-C66, Detroit, MI 48265.

Denso has multi immed openings for **SOFTWARE ENGIN III** in Seattle WA to work w/DENSO product groups includ, Thermal, Powertrain, & Electronics, to collect data/perform analysis & propose standardization & methodologies BS Comp Sci/Engin, Electr/Electron Engin or rel + 5 yrs exp, must incl., 4 yrs develop software for auto/vehicle indust., 2 yrs vehicle archit. for data commun., Send resume to: Denso Intl, 24777 Denso Dr., Southfield, MI 48033, Job Code: LC18-108

Denso has multi immed openings for **SOFTWARE ENGIN III** to develop software for next gen. AD/ADAS function, MS\*Elect/Electron Engin, Comp Sci/Engin, Robotics or rel + 2 yrs exp, must incl: Sensor Fusion, Signal Processing, TCP/UDP, C/C++, C#, Python, Matlab/Simulink, LUA, OpenCV, ROS, LCM, Libtiff/LibGeotiff; Will also accept BS + 5 yrs in above or any fully equiv. combo of edu/training & or/work exp. Send resume to: Denso Intl, 24777 Denso Dr., Southfield, MI 48033, Job Code: LC19-106

DRiV Automotive Inc. is recruiting for the position of **CUSTOMER APPLICATIONS ENGINEER** in Plymouth, MI, to design and develop friction products, define customer requirements, select materials, and perform validation testing, failure analysis and simultaneous engineering with manufacturing. Up to 15% travel required. Mail resumes referencing job code 543204 to HR, 44064 Plymouth Oaks Blvd, Plymouth, MI 48170. No calls or recruiters. EOE AA M/F/Vet/Disability.

Tenneco Automotive Operating Company Inc. is recruiting for the position of **SENIOR ENGINEER (MECHATRONICS - EMBEDDED CONTROLS)** in Grass Lake, MI, to design embedded controls for automotive systems including requirements analysis, architecture and design, VA/VE, standardization, implementation and troubleshooting for embedded controls software for damper product lines. Mail resumes referencing job code 536166 to HR, 3901 Willis Road, Grass Lake, MI 49240. No calls or recruiters. EOE AA M/F/Vet/Disability.

DRiV Automotive Inc. is recruiting for the position of **ALGORITHM DEVELOPMENT ENGINEER - RIDE PERFORMANCE** in Monroe, MI, to develop and integrate advanced suspension control strategies, support calibration of the control strategy, and contribute to software verification, validation and optimization. Up to 10% domestic and int'l travel required. Mail resumes referencing job code 51686810 to HR, 1 International Dr., Monroe, MI 48161. No calls or recruiters. EOE AA M/F/Vet/Disability.

Tenneco Automotive Operating Company Inc. is recruiting for the position of **SR LOGISTICS ANALYST** in Wayne, MI, to optimize transport flows and costs for Tenneco North America inbound, outbound and expedited transport providers; ensure service/performance of suppliers; support/develop logistics best practices. Up to 50% domestic and int'l travel required. Mail resumes referencing job code 523857 to HR, 3901 Willis Road, Grass Lake, MI 49240. No calls or recruiters. EOE AA M/F/Vet/Disability.

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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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