



InterACTION

The National Academy of Forensic Engineers • 1420 King Street • Alexandria, VA 22314

FALL/WINTER, 2017

SEE YOU IN PHOENIX! January 12-14 at the Hyatt Regency

You will find the NAFE conference schedule and registration forms on the NAFE website, www.nafe.org. A copy of the program is included at the end of this newsletter.

PRESIDENT'S MESSAGE

By **MICHAEL LESHNER, PE**



My year as NAFE President is nearly done, and the time has passed in a flash. I am proud of the progress we have made together this year and mindful of work yet to be completed. When we meet in Phoenix in a few weeks, the 2018 Board of Directors will be installed with Marty Gordon as the next President. I look forward to assisting the new Board and continuing to serve NAFE as a Past President.

The Phoenix conference features dual tracks on both Saturday and Sunday. [Registration](#) is open and the [Program](#) has been published. You can take advantage of a 10% early-bird discount on the seminar fees until December 15th. Members are welcome to attend the Committee Reports and Board of Directors meeting, which take place on Friday before the Conference.

Conference attendance has been very good the past few years, and we get an increasing number of “first-timers” at each meeting. We are also seeing an increase in the number of guests (spouses) who come for the NAFE dinner and enjoy the local

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tourist activities. The “National Association of Significant Others” organizes themselves very naturally each morning in the hotel for various activities while we engineers are at the seminars.

The most notable development this year is a change in Journal publishing and distribution. The NAFE Journal will now be distributed 100% digitally, and members can now download any NAFE Journal article online, any time, at no cost. Your code for 100% discount is on the Member Landing page when you login to nafe.org. We believe this new member benefit will make Academy membership even more valuable. We owe a debt of gratitude to the Technical Review Committee, authors, and peer-reviewers, who volunteer their time to maintain the high quality of our Journal.

Your Academy is financially sound and membership is stable. Each year we have members who leave the Academy and new members to take their place, resulting in a remarkably stable membership over the years. A quarter of the current Academy membership have joined in the past three years, bringing a fresh supply of future leaders.

There are opportunities to get more involved in the Academy through participation on committees, various task forces and election to the Board of Directors. Come sit in on the committee and Board meetings and don't be shy about contributing your thoughts and suggestions. The benefits of membership grow with increasing participation.

Special thanks to **Ross Curtis**, who leaves the Board in January as a Past President after serving on the Board of Directors in nearly every position during the past 14 years or perhaps more (Who remembers?).

I also want to thank our Executive Director Art Schwartz for his excellent guidance. In addition to general management of Academy business, Art is “NAFE Communications Central” for members, prospective members, the engineering community and the public.

Finally, I want to thank the membership for their loyalty to the Academy and its mission.

EXECUTIVE DIRECTOR'S MESSAGE

By ARTHUR SCHWARTZ, J.D., CAE

NAFE's energy is currently focused on the 2018 NAFE Winter Conference on January 12-14 at the Hyatt Regency - Phoenix, Arizona. The Hyatt Regency – Phoenix is a great facility in the heart of downtown Phoenix. We are looking forward to one of the best attended Winter Conferences with NAFE members, NAFE first-timers and guests, both nationally and internationally engaging in countless opportunities for great continuing education, networking, fellowship as well as great food and celebration. If you have not attended a NAFE conference before, this is a perfect opportunity. Take advantage of the 50% first timer discount available for each day's programs.

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Among the Phoenix Conference highlights will include:

- A Friday evening reception and dinner.
- NAFE Board of Directors Meetings where longer range strategic planning, membership, and other issues will be discussed and addressed;
- A meeting of the ASTM E-58 Committee where key forensic issues will be considered;
- Excellent technical and professional presentations during the Saturday and Sunday Regular and Special Seminars by NAFE members, on a variety of important forensic engineering and ethics topics, with breakfast, lunch and breaks providing additional opportunities for networking;
- *A special Advanced Fire Investigation Seminar on Sunday, led by international fire investigation experts Dave Ilove, P.E. and Gerald Haynes, P.E. This seminar will focus on the critical Job Performance Requirements (JPRs) of NFPA 1033 for fire investigators and provides background for NFPA 1033's "Basic Sixteen" knowledge requirements.*
- Continuing opportunities to network with "first timers" as well as members from the Canadian provinces and other international locales.

The new NAFE insignia which appears on the NAFE website continues to receive wide support and interest from many NAFE members, who have incorporated the insignia into their professional communications materials, consistent with NAFE policies. To increase branding, visibility and pride in the insignia among NAFE member and greater recognition among the public, new NAFE meeting signs were created which will be unveiled at the January 2018 NAFE Winter Conference. NAFE's new insignia has also been granted legal protection by the US Patent and Trademark Office.

NAFE headquarters continues to be very busy with membership inquiries and renewals, both nationally and internationally, CPD and other activities. We continue to explore opportunities for improvements and enhancements as we seek better and more efficient ways to serve you. NAFE has recently provided NAFE members free online access to all NAFE Journal articles, past and present.

As an example of its growing visibility and influence, NAFE has been accepted as a member of the National Council of Examiners for Engineering and Surveying (NCEES) Participating Organization Liaison Council (POLC). NAFE has also been invited by NCEES to participate in efforts to improve the NCEES Fundamentals of Engineering (FE) Examination. Greater involvement with NCEES has the potential of engaging state licensing boards on licensure mobility issues affecting NAFE members.

NAFE President Elect Marty Gordon recently made a presentation on forensic engineering and the benefits of NAFE membership to the Professional Engineers Ontario (PEO). NAFE also recently went on record in support of the Developing Tomorrow's Engineering and Technical Workforce Act introduced by Congressman Tim Ryan (D-Ohio).

NAFE was featured in a cover story titled “PE Law: Advocates for Reality” in NSPE’s PE Magazine’s July/August issue. A link to the article now appears on the NAFE website. NAFE leaders have continued discussions with the Society of Automotive Engineers (SAE) to explore the possibility of having SAE include NAFE Journal articles on SAE’s robust online platform.

I continue to receive a flurry of inquiries from attorneys, NAFE members and other interested in retaining the services of our expert NAFE members for various professional assignments. I routinely post these inquiries on the NAFE List Serve so that all NAFE members have an equal opportunity to review them, decide if they would be interested in pursuing the opportunities or recommend other qualified NAFE member for the assignments. So, if you are not on the NAFE List Serve, you need to be since the List Serve provides members with access to this information, share valuable professional and technical insights and pose important professional and technical practice questions. I continue to be very impressed how much NAFE members have been eager to share the benefit of their experience and expertise on the NAFE List Serve. Contact George Hall or Rocky Ford, the moderators.

I continue to be extremely impressed with NAFE members continued use of and access to the NAFE website, updating their personal and professional information, using the NAFE membership directory and the NAFE document library.

Please be sure to “Save the Dates” for the following events NAFE events for 2018 and 2019:

- *Again, the 2018 NAFE Winter Conference will be held on January 12-14 at the Hyatt Regency Phoenix in Phoenix, Arizona;*
- *Please note a change for July 2018. The 2018 NAFE Summer Conference will be held at the Hyatt Regency Buffalo, Buffalo, New York on July 27-29, 2018;*
- *The 2019 NAFE Winter Conference will be held at the Wyndham Grande Orlando Resort Bonnet Creek, Orlando, Florida on January 4-6, 2019;*
- *Details on the 2019 NAFE Summer Conference will be announced in the Spring 2018.*

Thank you for your NAFE membership and your continued support! If you have any questions or comments, please feel free to contact me at any time at 703-684-2845 or aschwartz@nafe.org

HAPPY 35TH BIRTHDAY TO NAFE!

The Saturday night NAFE dinner was truly a festive occasion. Not only was the buffet especially delicious, but the meal ended with pieces of this spectacular NAFE birthday cake.



NAFE's Past Presidents attending the Conference are pictured below. Marvin Specter, NAFE's founder, received special recognition for his contributions to the organization.

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From left to right: Mike Leshner, Les Wilder, Michael Kravitz, Smith Reed, Jeff Armstrong, Marvin Specter, Dusty Yaxley, and Ross Curtis.

EDITOR'S MESSAGE

By PAM CURTIS, InterACTION Editor

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Whom do you recognize besides Tami, Marian, and Judy?

The National Association of Significant Others

(NASO) certainly made the most of NAFE's 35th birthday in Atlanta. Our activities included a visit to Martin Luther King's home and museum, the Museum of Coca Cola, CNN headquarters, and the High Museum where we enjoyed a wonderful exhibition of Andy Warhol's work and, of course, the gift shop.

NAFE put on quite a birthday party. No one present will forget Friday's dinner in the Atlanta Aquarium. Who knew just how big whale sharks are! Saturday's birthday cake was just right after the delicious buffet—great barbeque both nights.

Thanks to Bonnie and Scott Grainger who have compiled a list of fun and interesting things for NASO to do in Phoenix. I have sent this list to NASO members twice—if you haven't seen it, ask your NAFE member to look it up for you on the NAFE website where it and previous issues of InterACTION are now posted.

This is my tenth and last newsletter. I am retiring with my husband, Ross, who is finally putting his forensic practice to bed. I have enjoyed being the editor, and I look forward to seeing everyone in Phoenix.

NAFE CROSSES BORDERS

CONTRIBUTORS: ROGER JEFFREYS P.Eng. Ontario Ministry of Labour and MARTY GORDON



On October 18 and 19, 2017, President-Elect **Marty Gordon** attended the semi-annual Engineers Meeting in Toronto, Ontario, where all 25 forensic engineers in the Ontario Ministry of Labour gathered from across the province. Marty Delivered a report, spoke to the group about membership in NAFE, and answered many questions. The engineers appreciated Marty's visit and thanked him for trekking to the not-so-frozen north.

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Currently eight engineers have joined NAFE or are in the process of joining. Marty invited the engineers to the summer NAFE Conference to be held in Buffalo, New York, from July 27-29, 2018. According to Marty, NAFE chose Buffalo specifically to make it easier for the Canadian engineers to attend.

Among their other responsibilities, the engineers in the Ministry of Labour investigate serious workplace injuries and fatalities. During the October meeting, three awards were presented by the Provincial Engineer for Excellence in Forensic Engineering. Those receiving awards included:

Patrick Giard, P.Eng. for his forensic investigation into the fatal cyanide poisoning of a worker in a gold processing plant in 2015.

Saeed Khorsand, P.Eng. for forensic engineering on the Downsview Stage collapse at a Radiohead concert resulting in the death of a drum technician in 2012.

Brian Sanders, P.Eng. for his forensic investigation into the partial collapse of the rooftop parking deck of the Algo Mall in Elliot Lake in 2012 and his testimony at the Elliot Lake Commission of Inquiry in 2013.

[CONRAD HOFFMAN PUBLISHES BOOK](#)

Back in 2013, *InterACTION* printed my *Personal Experience*, actually my very first case as a forensic engineer. It had a humorous and unexpected ending. People read the piece and several asked me what other cases I've been involved in that might have similar interest. After thinking about it, I realized that some of those cases could be used to illustrate what a forensic engineer might expect in the courtroom and what the courtroom might expect of him or her. I discussed it with my wife, Peggy, and she thought it was a great idea. Then I forgot about it, but Peggy didn't. One day, I came home after a trial where I testified for the plaintiff. The expert for the defendant didn't fare very well on the stand and I felt sorry for him. My wife said, "Maybe if you had written that book and he read it, he might have done better." That did it, and I've just completed *Forensic Engineering Experience & Example – The Forensic Engineer and Premises Liability*. It will be available in January, 2018. Included are examples from the more than forty times I've testified in court and I hope it provides some insight into courtroom testimony, report writing and at the very least, illustrates some light, sometimes funny, sometimes tragic events in the life of a forensic engineer.

Here's an excerpt--it's the case I call "**Freddie the Flopper.**"

Wintertime slip and falls in the Northeast are as common as fried chicken in the South. This case had both.

The claimant was a middle-aged man. According to him, while descending an exterior concrete stairway at a private housing complex, he slipped on ice, tumbled to the bottom of the stairs where he lay for some time until a woman passerby heard him moaning and came to his aid.

He lived on a street adjacent to and north of the complex. On a Friday evening he left his apartment, walked up the hill to a take-out restaurant where he picked up an order of fried chicken to go. He fell on his way back to his apartment.

I examined the concrete steps, checked the lighting, took all the necessary measurements and photos and was just getting ready to leave the site when a uniformed employee of the housing complex drew up in a golf cart and asked me what I was doing. I told him that a man had fallen on the stairs and I was there at the request of his lawyer to check for any defects in the stairway that could have caused the accident.

Instead of ordering me off the private property site, which was what I expected, he just sat there laughing and said, "His name wouldn't be Fred, would it?" I said it was and he laughed again and said "Freddie the Flopper is at it again." He said every year or so Freddie would have a slip and fall somewhere in the neighborhood, run to a lawyer and try for a cash settlement. I must be working for an out-of-town lawyer, he said, all the local ones knew Freddie.

I called my client and told him the story, and added that there was at least one confusing part of Freddie's story. His apartment and the take-out restaurant were on the same street. The housing complex was at least one block further to the south. What was Freddie doing on the stairs that were clearly out of his way?

Freddie was called in to discuss his case. When confronted with the statement by the housing complex employee and the question of why he went so far out of his way, Freddie laughed and said, "Well, I guess you got me. You know, nothing went right that night. I went down the stairs, rolled on the ground and snow for a while and started moaning. Would you believe it--no one came, so I started moaning louder. I mean, I could hear people walking by up above – wouldn't you think they'd have the common decency to come to my aid? What's this world coming to? Anyway, after nearly thirty minutes with both me and the chicken freezing, that lady finally came down and found me. Then it took forever for the ambulance to arrive and it's a wonder I didn't get pneumonia." The lawyer suggested that he leave.

INSIGHT INTO THE NEWEST TECHNOLOGIES IN ACCIDENT RECONSTRUCTION

By DR. RICHARD ZIERNICKI, PE

What is a computer animation?

Computer animation is a visual enhancement of expert testimony which is subject to a lot of criteria and scrutiny. Not all animations are allowed to be presented in court. Before the animation is accepted by court of law and before it can be presented in court, there are certain criteria and some challenges that need to be met. After all the challenges are met, then the judge decides whether or not to allow the animation to be presented.

How are animations created?

Animations are created with a scientific accuracy based on compiling a lot of data, and physical evidence.

We are relying on evidence like tire marks, debris, scratch patterns, vehicle damage in cases of motor vehicle accidents. We take all the engineering evidence and use that evidence to provide a foundation for the animation. This foundation and the scientific method used is one of the fundamental criteria used by a judge to decide whether or not that animation is accepted by the courts. It's not just somebody else's vision of the accident. It is this scientific reliable data that is the foundation and base for the animation. We use sophisticated, validated engineering programs such as PC Crash that will find the motion of the vehicles before the accident, during the accident, and after the accident.

Is the use of computer animations allowed in court?

Computer animations have been used in a courtroom since the mid 80's. During that time, they have been a part of many of my high-profile cases.

I think the most interesting case I have worked on in the past is the Princess Diana accident reconstruction. I was involved in investigating this accident right from the beginning including some very advanced testing on the speedway in Los Angeles. We had the entire speedway for the purpose of that testing. We tried to replicate or reenact the collision between two cars. One car was a Mercedes S-class and the second car was a little Fiat Uno. Although we did not use a Mercedes S-class or Fiat, we used a Lincoln Town Car and a Ford Fiesta to try to duplicate the condition where two cars collided with little damage to the Fiat, or Fiesta in our case. There was some debris of tail lights on the road. We were able after about 7 hours and so many tries, to finally get a case where nobody was injured, but we got a little bit of interaction with those vehicles. Remember, they were moving at quite different speeds. One vehicle was doing about 70 mph and the other vehicle was doing half that speed. To clip those two cars without causing a lot of damage was not easy. It was a very simple concept but very complicated in a real test. Then we did a crush analysis and created the computer animation of that accident. It was a very interesting project.

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What is the Process of 2D and 3D rendering?

In our multi-media room, we have six cameras mounted on the wall and ceiling. Those cameras are used for Motion Capture (MoCap), which is a specific process to track and analyze the motion and movement of humans that is then transferred into an animation.

We use real people: they move, they walk, they run, they fall, and the camera is tracking them. We can find out how the joints of the human body move and then we can transfer that motion into virtual space. We apply it to a virtual character that matches the size and description of the person involved in the accident.

Everything we do on an animation level is in three dimensions or 3D. We use all the latest 3D modeling and animation software and we sometimes use 20 different pieces of software on one project. We always use the newest version of software so we have the best features available to create the best animations possible. Beyond that, we also write our own programs or scripts that work together with the animation software to perform specialized tasks and analyses customized for the specific needs of the project.

What is 3D scanning and how does it help in accident reconstruction?

High Definition 3D laser scanning is phenomenal technology that has been in place for about 5 years for commercial application. In the past, using the typical method of surveying, you would have a "Total Station," where an individual person has some equipment mounted on a tripod in a construction area. That person is pointing and shooting a laser to capture some points and another person is holding a pole with a reflector. That process was cumbersome and time consuming. It could take an entire day to shoot maybe 800 points where today's scanner can automatically shoot about 45 million points in approximately 10 minutes.

For example, if you take 4 different scans to document a motor vehicle or document a building, you would cover around 200 million points in one hour. Each point has XYZ coordinates so you can go inside virtual space and find out any distance or measurement between two points in that scan out of those millions of points. So it is like a virtual model of the real world in your computer. If you scan this room, you can find out the distance from the tip of your nose to the camera and that can be found with the accuracy of 1/16 of an inch. If you want to know how far it is from point A to point B out of millions of available data points, you will have all that information available and documented forever.

You might say, why bother with that when you can take a picture? The problem with the picture is there are no dimensions. You can see the object in the picture but to determine how far is it from point A to point B, you have to use convoluted photogrammetry methods. Laser scanning is very useful when a car has crush damage that needs to be measured, or when a bridge or building collapses. You freeze that moment in time and you come back and measure anything you want.

What are new, upcoming technologies that are useful in the field of forensic engineering and animation?

Drones:

We started to experiment with drone technology to capture data such as aerial photos and video to build very accurate 3D models directly from the imagery. The drone allows us easy access to places we couldn't go before. The technology has developed so rapidly that now there are quadcopters with integrated 4K cameras that are much easier to operate safely.

Match Moving:

Match moving is an established scientific process that is used to calibrate a virtual camera to "match" the properties and movement of the real-world camera that captured the video. Using High-definition 3D laser scanning technology makes it possible to accurately perform the match moving process and to evaluate the results. Once a virtual camera is accurately calibrated, moving objects visible in the video can be tracked or matched to determine their dynamic position, orientation, path, speed and acceleration.

What is an interactive animation?

The classical animation was like a movie that you could play, fast forward, and rewind, or pause and stop. You only view it in a linear fashion from one perspective. With an interactive animation, without any training or any special instructions, you can move and position the camera to a different location within the 3D virtual scene and view that animation from any point of view you are interested in seeing. For instance, you could move the camera 27 feet north and point it wherever you like, and you can see the same motion of those vehicles from that perspective. No special software for the user is required.

What does the use of photogrammetry involve and how is it useful?

The photogrammetry process is the process of attaining 3-dimensional information or measurements from photographs. Sometimes, we have photographs taken two years ago by an insurance agent; the car is gone, nothing is available but some photographs from the accident scene showing some skid marks or debris. Then, two years later, we want to reconstruct the accident. The car is gone, or the roadway may have been modified because the tire or skid marks aren't going to stay forever depending on how busy that roadway is.

If all you have are photographs, then the question is how to figure out how long those skid marks were. Instead of guessing or eye-balling it, there is a technique called photogrammetry by which we can figure out the dimensions of that skid mark. Furthermore, we can find out how much crush we have on that car. By looking at the photographs with the proper software, we can learn the depth of the crush and the location of the crash. We can quantify that damage; it is very useful for engineers to calculate the speed because speed is the result of the engineering analysis, energy balance, and energy calculation, and for that you need to quantify that crash.

What is a Real-time simulation?

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Real time simulation has been available since the beginning of the 90's using accident reconstruction software. One of the most popular accident reconstruction software programs used by engineers is "PC Crash" which we have utilized for 22 years. The accident reconstruction programs take into account the physical properties of the motor vehicle including its weight, size, center of gravity, geometry and inertial properties. In addition, the physics-based model can be used to simulate the motion of the vehicle to match certain physical evidence on the roadway. That's why it had become known as simulation software because it will simulate in virtual space the motion of the vehicle using documented physical evidence collected or obtained from an accident scene, such as gouge marks, tire marks, final rest position, and point of impact. This information is analyzed and processed by the computer program that results in a simulation of how the vehicle got from point A to point B matching very precisely the physical evidence that was created during an accident. It takes many trials and errors to achieve this precision, but if you are patient you can get a very good match.

What is video matching?

Video matching is a process where you are able to incorporate computer-generated objects into a video background. We can incorporate vehicle motion on top of real video taken of the accident scene. Because we are simulating everything in virtual space, we can take that video and camera properties, and the modeling software will determine the exact location where the camera is taking the video. If the camera is in motion inside the vehicle, it will calculate and determine precisely how that camera is moving in virtual space. One of the ways we bring a vehicle into virtual space is to perform a three-dimensional laser scan of the vehicle. With this digitally scanned model of the vehicle, we can integrate the vehicle motion with videos obtained from an accident scene and combine them together for photo-realistic video quality animations.

[PUT THE BRAKES ON FATALITIES, PENNSYLVANIA](#)

By **HAL SCHWARTZ**

Each year **Harold Schwartz, PE**, asks his state representative, Stan Saylor, to prepare the following resolution from the Commonwealth of Pennsylvania House of Representatives:

Whereas, The number of highway deaths on Pennsylvania roads totaled 1,188 in 2016, the lowest number since recordkeeping began in 1928; and

Whereas, There are many controllable causes of traffic fatalities, including excessive speed, use of alcohol and drugs, inexperience, carelessness and distracted driving; and

Whereas, The National Society of Professional Engineers, the National Academy of Forensic Engineers, The Institute of Transportation Engineers Expert Witness Council and a coalition of government agencies have teamed up to focus national public awareness on October 10, 2017, on the cause of traffic fatalities and the need to reduce the number of traffic fatalities; and

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Whereas, On “Put the Brakes on Fatalities Day,” all drivers should take an extra measure of care to ensure the safety of themselves and other by:

- (1) driving courteously and defensively;
- (2) knowing the rules of the road for their method of transportation and obeying all traffic laws;
- (3) wearing protective gear, seat belts or helmets;
- (4) avoiding speeding or driving while impaired or driving aggressively; and
- (5) avoiding talking or text messaging on cell phones while driving;
- (6)

Therefore be it

Resolved, That the House of Representatives designate October 10, 2017, as “Put the Brakes on Fatalities Day” in Pennsylvania.

Signed by MIKE TURZAI,
Speaker

NAFE SUPPORTS LEGISLATION

Representatives Tim Ryan (D-OH), Tom Reed (R-NY) and Paul Tonko (D-NY) Introduce Legislation to Develop Tomorrow’s Engineering and Technical Workforce

Washington, DC-- Representatives Tim Ryan (D-OH), Tom Reed (R-NY) and Paul Tonko (D-NY) introduced the Developing Tomorrow’s Engineering and Technical Workforce Act. This legislation would award grants to states, educational agencies and local educational agencies to support, develop, and implement formal and informal engineering education programs in elementary schools and secondary school. It will help provide school districts the resources to incorporate engineering and engineering technology education into their science standards.

“Our global economy is being driven by the achievements and visionary work of the world’s greatest scientists and engineers. As an engineer myself, I know the impact we could have if we empower America’s school to teach engineering as part of the core curriculum. Making these investments in our students now will not only strengthen their ability to secure good jobs, contribute to their community and support loved ones later in life, it will also help the United States become more globally competitive and remain the world’s leading economy long into the future.” said Rep. Tonko.

NAFE and NSPE are among the groups supporting this legislation.

LEGISLATIVE REPORT

By ROSS CURTIS, CHAIR OF THE LEGISLATIVE COMMITTEE

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From NSPE's Daily Designs, December 5, 2017:

In STEM Push, Local Schools Are More Involved In Robotics Programs.

The [AP](#) (12/4, Goldberg) reports, in a story examining Michigan school's increasing involvement in robotics programs, that "STEM education – science, technology, engineering and mathematics – is a new movement in American education that helps prepare students for the workforce," and that "being involved in STEM education classes helps a student prepare for the job openings that will be available." Michigan teacher Melissa Doubek said, "There are so many job openings right now, especially in Michigan. There are job openings in stem-related careers and there are possibilities for jobs here in Alpena." Early exposure to education in STEM fields may prepare students for a variety of careers in the sciences, the AP writes, pointing out that "students realize they like certain fields of science and there are different fields that students can pursue careers in. Doubek said there are some students who aren't interested in engineering, but are instead interested in medicine." In addition to education that better prepares them for the future workforce, robotics program mentors note that as part of robotics competitions "students learn how to develop and how to further themselves," developing skills they can use regardless of the future career they choose.

BMW Targets 50 Percent Increase In EV Sales Next Year.

[Bloomberg News](#) (12/4, Behrmann) reports Klaus Froehlich, the head of research and development for BMW AG, revealed on Monday that the company is planning a 50 percent increase in the sales of plug-in hybrid and battery cars next year "to defend its position in the electric-car shift as competitors like Volkswagen AG ready their own battery lineups." BMW is aiming to sell 150,000 cars in 2018, which also represents "a jump of about two-thirds from last year's deliveries of green cars." Froehlich told reporters, "We'll definitely boost sales by a mid-double digit amount. ... This is to stay ahead of the competition that's starting to do its own rollout."

According to [Reuters](#) (12/4, Preisinger), the company sold 78,100 of these vehicles in the first 10 months of 2017. Meanwhile, BMW CEO Harald Krueger "said BMW aimed to keep its return on sales around 8 to 10 percent even with the added costs of developing electric cars."

GM Adds E-Commerce Marketplace To Dashboard Screen.

[Reuters](#) (12/5) reports that General Motors announced Tuesday that it will equip newer cars with in-dash e-commerce technology, "betting it can profit as drivers order food, find fuel or reserve hotel rooms by tapping icons on the dashboard screen, instead of using smartphones while driving." GM's Marketplace technology will be uploaded automatically to about 1.9 million model-year 2017 and later vehicles starting immediately, with about 4 million vehicles across the Chevrolet, Buick, GMC, and Cadillac brands equipped with the capability in the United States by the end of 2018, GM said. Reuters adds that Amazon "is partnering with other automakers, including Ford Motor Co., to offer in car ecommerce capability through Amazon's Alexa personal assistant system."

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As American Automakers Downplay EVs, European Rivals Embrace Electrification.

The [Los Angeles Times](#) (12/4, Mitchell) says the Los Angeles Auto Show highlights that while the “big American companies – and to a large extent, the Koreans and the Japanese – keep their electric efforts low-key, European carmakers, led by the German Big Three, are aggressively dramatizing their strategic shift toward electrified powertrains at the Los Angeles Convention Center.” The Times states that “despite all the attention on electrification, most of the cars being touted in L.A. are plug-in hybrids” and “most of the pure electrics are concept cars,” but European automakers “are promising a flood of electrified vehicles of all varieties starting in 2019 or 2020, with momentum building to mid-decade.”

From NSPE’s Daily Designs, December 6, 2017:

Safety Incidents Involving Civilian Drones Rise In US.

[Bloomberg News](#) (12/5, Flatley) reports US Federal Aviation Administration data has shown an increase in the number of safety incidents involving civilian UAVs. According to the data, the FAA has received 1,688 reports from January through September of UAVs flying in restricted airspace or appearing to violate rules. The agency received a total of 1,754 reports last year and 1,210 reports the year before that. The FAA “encourages pilots, air-traffic controllers and police to report incidents they believe raise safety concerns with drones.”

In related news, [Reuters](#) (12/5) reports the International Air Transport Association (IATA) said Tuesday that law enforcement authorities should play a strong role to making sure that suitable deterrents are in place to prevent recreational drones from posing danger to passenger aircraft. The IATA proposed fines, “registration of drone users and technology to prevent drones from straying into unauthorised areas [to] lessen the risk.”

AP Compares Educations Of Trump and Obama Science and Environment Nominees.

In a feature analysis, the [AP](#) (12/5, Borenstein) reviews many of the Trump Administration’s appointments for science-related positions and reports that “of 43 Trump Administration nominees in science-related positions – including two for Health and Human Services secretary – almost 60 percent did not have a master’s degree or a doctorate in a science or health field.” During the Obama Administration, the AP reports that the numbers were reversed, “more than 60 percent had advanced science degrees.” Former EPA chief and Republican governor Christie Todd Whitman said, “This is just reflective of the disdain that the administration has shown for science.”

Keeping AMT In Tax Reform Could Make R&D Tax Credit Moot.

[CNN Money](#) (12/5, DePillis) reports that the “last-minute decision by the Senate to keep the alternative minimum tax (AMT) instead of repealing it” could have adverse consequences for US innovation. The AMT “serves as a backstop that prevents corporations from taking so many credits and deductions that they pay no tax at all,” and currently, “companies calculate their ‘regular’ corporate tax rate – which tops out at 35%, minus any exemptions – and pay either that or a 20% rate on an ‘alternative’ income formulation, whichever is higher.” While it was repealed in House tax reform legislation, the AMT remains in the Senate bill, and “if it’s not removed, that could render the R&D credit moot, since more companies will have to pay a minimum tax under the AMT that can’t be lowered further by most credits or deductions.” [MarketWatch](#) (12/5, Schroeder) calls the corporate AMT “a hurdle to a final tax bill,” and it cites a comment by House Ways and Means Committee Chairman Kevin Brady that “says the corporate alternative minimum tax ‘undermines’ pro-growth provisions in the tax code.” [Bloomberg News](#) (12/5) reports, in article on the status of House and Senate efforts to reconcile a final tax bill, that “two influential GOP senators – Senator Rob Portman of Ohio, one of the chamber’s main tax writers, along with Senator Orrin Hatch, chairman of the tax-writing Senate Finance Committee – said their preference is to repeal the corporate AMT.” It quotes Portman saying, “I’m not a big AMT fan,” and, Hatch said, “I’d like to get rid of it.” [Reuters](#) (12/5, Becker) published a “Factbox” analyzing points to be resolved between the House and Senate bills, including the corporate AMT.

From the ASCE SmartBrief, December 6, 2017:

Cross-agency climate panel disbanded by White House

The US Community Resilience Panel for Buildings and Infrastructure Systems has held its last meeting after the Trump administration announced it was disbanding the cross-agency climate change protection panel. The group, which consulted with planners and officials on climate-aware infrastructure building, was described by its chair as "one of the last federal bodies that openly talked about climate change."

Minn. confronts aging water infrastructure, \$11B shortfall

Minnesota needs to spend about \$11 billion to repair aging water and sewer infrastructure but doesn't have adequate funding. Many of the pipes were built during the Great Depression, and several water treatment plants across the state are 30 or 40 years old.

From NSPE’s Daily Designs, December 7, 2017:

Chao Expects Infrastructure Package To Be Announced In January.

In its Morning Transportation rundown, [Politico](#) (12/6, Snyder) reports Transportation Secretary Elaine Chao said on Tuesday that the Trump Administration is hoping to release its plan for an infrastructure package in early January. She said, “You’re going

to see it, just not at the original timeframe.” Politico explains that President Trump had promised an infrastructure package in his first 100 days. Senate Environment and Public Works Committee Chairman John Barrasso (R-WY) said he has been working “with the administration as well as both sides of the aisle to move in that direction.”

Murkowski Touts Senate Energy Bill As Springboard For Trump’s Infrastructure Plan.

[Platts](#) (12/6, Melvin) reports that Sen. Lisa Murkowski, chairman of the Senate Energy and Natural Resources Committee, is touting the Senate’s bipartisan energy bill as an springboard for President Trump’s infrastructure plan, which remains short on details. She said the bill, would which streamline permitting for natural gas and hydropower projects, facilitate LNG exports, support modernization of the electric grid, and more, is “ready to go and that’s already pre-vetted.”

Girl Scouts Of America, Raytheon Partner To Promote STEM.

[WILX-TV](#) Lansing, MI (12/6) reported that the Girl Scouts of America are partnering with Raytheon to train “the next generation of cybersecurity and robotics professionals.” The partnership is intended to help bring diversity to the STEM workforce. The Girl Scouts will be awarding badges focused on STEM subjects starting in 2018.

Exxon To Import Fuel Into Mexico For Gas Stations From US Refineries.

[Bloomberg News](#) (12/6, Stillman, Williams) reports that on Wednesday, Exxon said it will import fuel from its US refineries into Mexico’s central state of Guanajuato, rather than purchasing fuel for its gas stations from Pemex, following Mexico’s move to liberalize gasoline and diesel prices across the country last week. More foreign firms intend “to invest in ports terminals, fuel storage facilities and other logistics infrastructure in order to compete with state-owned” Pemex. Chevron said last week that it will bring products into Mexico from its California refining system to supply its fuel stations once the infrastructure is available. IHS Latin America upstream director Alejandra Leon said, “U.S. Gulf refineries have seen increasing utilization rates, they are cheaper and more efficient than they were previously, and they have abundant supply for the Mexican market.” Meanwhile, “more private infrastructure projects would be ready in the next several years, making it easier for private companies to import fuel without going through Pemex, she added.”

From the ASCE SmartBrief, December 7, 2017:

Calif. Democrats want new bridge over San Francisco Bay

California Democrats Sen. Dianne Feinstein and Rep. Mark DeSaulnier have called upon the state’s Metropolitan Transportation Commission to build another bridge over the bay between Oakland and San Francisco, and they want toll revenue to fund the project. The bridge would be south of the Bay Bridge and could significantly reduce congestion

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NEWSBRIEFS--NAFE MEMBERS ARE ACHIEVERS!

DEREK HODGIN, PE, President of Construction Science and Engineering, Inc., presented a series of seminars on Dealing with the Challenges of Mid-Rise Wood Frame Construction in 2017, including one in Clemson, SC.

STEVE D. KNAPP, PE, gave the following presentations: “Ins & Outs of Plumbing Losses” at the National Association of Subrogation Professionals (NASP) 2017 Annual Conference in Austin, TX on Nov. 6, 2017; “Motorcycle Accident Reconstruction” at the CSAA Insurance Group in Colorado Springs, CO on August 24, 2017; “Forensic Engineering Analysis of a Motorsports Racing Incident” at the NAFE Conference in Atlanta, GA, on July 22, 2017.

STEVE received the 2017 Project Manager of the Year award from NSPE-Colorado on June 15, 2017.

MATHEW MARTONOVICH, PE, has completed all of the requirements for a Master of Science degree in Civil Engineering through the College of Engineering and Applied Science at the University of Colorado Denver. His multi-disciplinary academic focus has included study in both Civil and Mechanical Engineering, which includes course work in Traffic Safety Data Analysis, Highway Capacity Analysis, Traffic Operations and Signalization, Advanced Street and Highway Design, Traffic Impact Assessment, Internal Combustion Engines, Advanced Engineering Mathematics, Biomechanics, and a thesis topic, “Measurement and Performance Analysis of Pneumatic Braking Systems on Heavy Vehicles”. Commencement ceremonies will be held on December 16, 2017, at the Colorado Convention Center in Denver, Colorado.

WILLIAM H. PIERCE, PE, received the 2017 Young Engineer of the Year award from NSPE-Colorado on June 15, 2017.

BEN T. RAILSBACK, PE, presented “Forensic Engineering Analysis of Unintended Movement of Powered Industrial Trucks” at the NAFE Conference in Atlanta, GA, on July 22, 2017.

DHIRENDRA S SAXENA (SAX), PE has recently earned his professional certification as a Certified Forensic Litigation Consultant (C FLC) from Forensic Expert Witness Association (FEWA), a nationwide organization of professionals from a variety of discipline(s). Certification criteria requires completion of educational courses in the subjects of forensic analysis, litigation consulting, and expert witnessing, and familiarity with the duties and responsibilities of providing forensic consulting and expert witness services in litigation claims as per their "Core Program".

Sax has also been granted the status of Diplomate in Geotechnical Engineering by the Association of Geo-Professionals (AGP). He received his AGP certificate and pin at the April 17, 2017 induction ceremony in Orlando, Florida of the 11th class of D. GE inductees.

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PROGRAM AND SCHEDULE

NAFE WINTER MEETING, PHOENIX, AZ

Friday, January 12

- 8:00 NAFE Committee Meetings - Meeting room open for committees to meet
- 9:15 NAFE Board of Directors Meeting - Morning Session (including Committee Reports) 11:30 Lunch break (on your own)
- 1:00 NAFE Board of Directors Meeting - Afternoon Session (Board Business)
- 3:30 ASTM E58 Forensic Engineering Technical Committee meeting - adjourns by 5:00pm
- 6:00 to 9:00 pm NAFE Reception and Dinner at the hotel

Saturday, January 13, 2018 - Two tracks of technical presentations (7 CPDs)

- 7:00 am Round Table Discussion (includes breakfast)
- 8:15 am Opening Remarks and Introductions – Michael Leshner, PE (2017 NAFE President)

MORNING TRACK 1 — CIVIL / STRUCTURAL

- 9:00-9:40 Rune Storesund, PE – “FE Evaluation of Hillside Excavation for a Construction Contract Dispute”
- 9:40-10:20 Edward Fronapfel, PE – “The Conservatory: A Case Study in Underdrain Design Methodologies, Performance and Failures”
- 10:20-11:00 William Walker and Paul Carr, PhD, PE – “FE Evaluation of Lost Labor Productivity Claims on Construction Projects”
- 11:00-11:40 Curt Freedman, PE – “Utilization of Solar Insolation Parameters for HVAC, Building Freeze Damage, Vehicle Pedestrian Solar Glare Accidents, Roof & Siding Damage, and Solar Performance FE Applications”

MORNING TRACK 2 — MECHANICAL / PRODUCTS

- 9:00-9:40 Daniel Couture, P.Eng. – “FE Investigation of Furnace Oil Supply Line Fitting Leak”
- 9:40-10:20 Anthony Sasso, PE – “FE Analysis of Common Failures and Inspection Procedures for Residential and Commercial Chairs”

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10:20-11:00 Bart Kemper, PE – “Misuse of Pressure Vessel Codes in Forensic Applications”

11:00-11:40 R. Vasu Vasudevan, PE and Jeremy Britton, PE – “FE Analysis of a Failed Clamp on a Pool Filter Housing”

11:40 Membership Meeting, Activities Report, Induction of 2018 Board of Directors – Ross Curtis, PE

12:30 Round Table Discussion (includes lunch)

AFTERNOON TRACK 1 — FIRE INVESTIGATION

2:00-2:40 John Certuse, PE – “Fire Caused by Control Failure due to Intentional Manufacturing Deviation from Tested Design”

2:40-3:20 Jerry Tindal, PE – “FE Analysis of a Fire Origin and Cause Allegedly Involving an Overfilled Propane Cylinder”

3:20-4:00 David Icove, PhD, PE and Thomas Lawton – “Forensic Identification and Cause of Hot Socket Problems in Electrical Meters”

4:00-4:40 Jeffrey Lange, PE – “FE Analysis of a Cloned Ignition Coil Pack”

AFTERNOON TRACK 2 — VEHICLES & TRAFFIC

2:00-2:40 Richard Ziernicki, PhD, PE, William Pierce, PE, and Angelos Leiloglou – “FE Analysis of Projectile Thrown from Phantom Vehicle”

2:40-3:20 Jerry Ogden, PhD, PE and Mathew Martonovich, EI – “FE Analysis of Commercial Vehicle Air Brake System Performance”

3:20-4:00 Richard Ziernicki, PhD, PE, Angelos Leiloglou, Taylor Spiegelberg, and Kurt Twigg – “The Application of Match Moving for FE Analysis”

4:00-4:40 Robert Peruzzi, PhD, PE – “FE Analysis of the Alleged Failure of an Emergency Vehicle Traffic Light Preemption System”

4:40-5:00 Follow-up Q & A Session for Technical Presentations

5:00 Adjourn

6:00 Cocktail Reception (Cash Bar)

7:00 Dinner on your own

Sunday, January 14, 2018 - Two tracks of Educational Seminars (7 CPDs)

7:00 Networking Breakfast

8:15 Opening Remarks: Martin Gordon, PE – 2018 NAFE President

MORNING TRACK 1

9:00 "Ethics, Law and Public Policy Affecting Forensic Engineers" - Arthur Schwartz, JD, CAE and Samuel G. Sudler, P.E., IntPE, CFEI, CVFI

10:45 "US Embassy Soldier's Panamanian Mistress Murdered or Pedestrian v. Auto Accident? Subtle Engineering Evidence Solves International Mystery" Laura Liptai, PhD, and Joshua M. Toman, Esq. Major U.S. Army (Retired) JAG Prosecutor

MORNING TRACK 2

8:45 "Advanced Fire Investigation for Professional Engineers" - David Icove PhD PE and Gerald Haines PE. (Authors of Kirk's Fire Investigation, 8th Edition) This seminar will focus on the critical Job Performance Requirements (JPRs) of NFPA 1033 for fire investigators and provides background for NFPA 1033's "Basic Sixteen" knowledge requirements. ([more](#))

12:00 Round Table Discussion (includes lunch)

AFTERNOON TRACK 1

1:30 "Nighttime Conspicuity and Illumination", James Hyzer, PhD

2:30 "Effective Coordination and Communication Between Attorney and Expert" - Gary Lento, Esq.. Special Counsel to the Arizona Attorney General's Office

AFTERNOON TRACK 2

1:30 "Advanced Fire Investigation for Professional Engineers" - David Icove PhD PE and Gerald Haines PE. (Authors of Kirk's Fire Investigation, 8th Edition) This seminar will focus on the critical Job Performance Requirements (JPRs) of NFPA 1033 for fire investigators and provides background for NFPA 1033's "Basic Sixteen" knowledge requirements.

4:30 Open Q&A Session - All Speakers – All Topics - Moderator: Robin Davies, PE

5:00 Adjourn