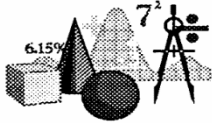




SPARKS

Daytona Section Newsletter
January 2022

<https://r3.ieee.org/daytona/>



SECTION MEETING
Thursday January 27th
7:00 – 8:30 PM
Lehman Building, Room LB267
Embry-Riddle Aeronautical University
Daytona Beach

CHAIR'S REPORT



In previous newsletters, I mentioned the format of our meetings are changing. This month is a perfect example.

Dr. Currier, last month's speaker, has been involved with autonomous vehicles since the earliest models were being developed for DARPA. His students are researching next-generation econ vehicles. They will be providing a presentation of their

research as well as a tour of the lab later at this months meeting. This meeting will take place at ERAU, details are shown further in the newsletter. I believe, we can all agree, this is a definite change of format and hope we can have many more open-format meetings. I look forward to seeing all of you there. Invite your friends as this is research relevant to a wide array of people.

Now, let me briefly discuss changes that are mandatory. Region 3 is auditing all sections and chapters for compliance. To remain in compliance all sections and chapters are required to have a minimum number of meetings AND to report those meetings. The Daytona Section meets those requirements. Over the next 60 days I am asking that all three of our student chapters hold meetings and report them. Any unit not meeting the requirements are being shut down by Region 3/IEEE with two in Florida targeted during the final months of 2021 – though the Florida Council was able to step in and salvage the situation. Let us not find ourselves in that situation. Once a unit is shut down, it is a major effort to start them up again.



2021 Outstanding Section Membership Retention Performance
Daytona Section

Hundreds of you are notified every month via email regarding section events, newsletters, etc. Please take advantage of these notifications and participate in our activities. I am looking to involving more of our computer members, as they are the largest representative group in the Daytona Section. Any ideas? Feel free to contact me directly via email or our Facebook page with ideas, questions, or comments.

Shawn

NOVEMBER / DECEMBER'S PRESENTATION

THE ORIGINS OF AUTONOMOUS DRIVING: THE DARPA GRAND CHALLENGES (part 1)

Dr. Patrick Currier, Professor and Associate Chair of Mechanical Engineering at Embry-Riddle, gave a very interesting and informative presentation about the history of autonomous driving. Dr. Currier has extensive experience with the DARPA Grand & Urban Challenges of the mid 2000's. These challenges addressed the mainly theoretical problem of autonomous driving by challenging teams around the world to compete, thus accelerating the industry and kick-starting the autonomous driving revolution.

JANUARY PRESENTATION– Come see the cutting edge in automotive electronics

THE ECOCAR MOBILITY CHALLENGE (part 2)

The EcoCAR Mobility Challenge (EcoCAR) is the latest U.S. Department of Energy (DOE) Advanced Vehicle Technology Competition (AVTC) series. This is a four-year competition, which challenges 12 university teams to apply advanced propulsion systems, connected, and automated vehicle technology to improve the energy efficiency, safety, and consumer appeal of the 2019 Chevrolet Blazer, specifically for the carsharing market.

The competition is sponsored by DOE, General Motors (GM), and MathWorks, and managed by Argonne National Laboratory. EcoCAR is considered the heart of automotive ingenuity, working towards future mobility solutions. Embry-Riddle Aeronautical University's EcoEagles have been doing well in the past competitions and are participating in the EcoCAR Mobility Challenge competition.

During this monthly IEEE meeting, EcoEagles will give a presentation to discuss their EcoCAR design and a tour of their garage for the attendees to see their vehicle.

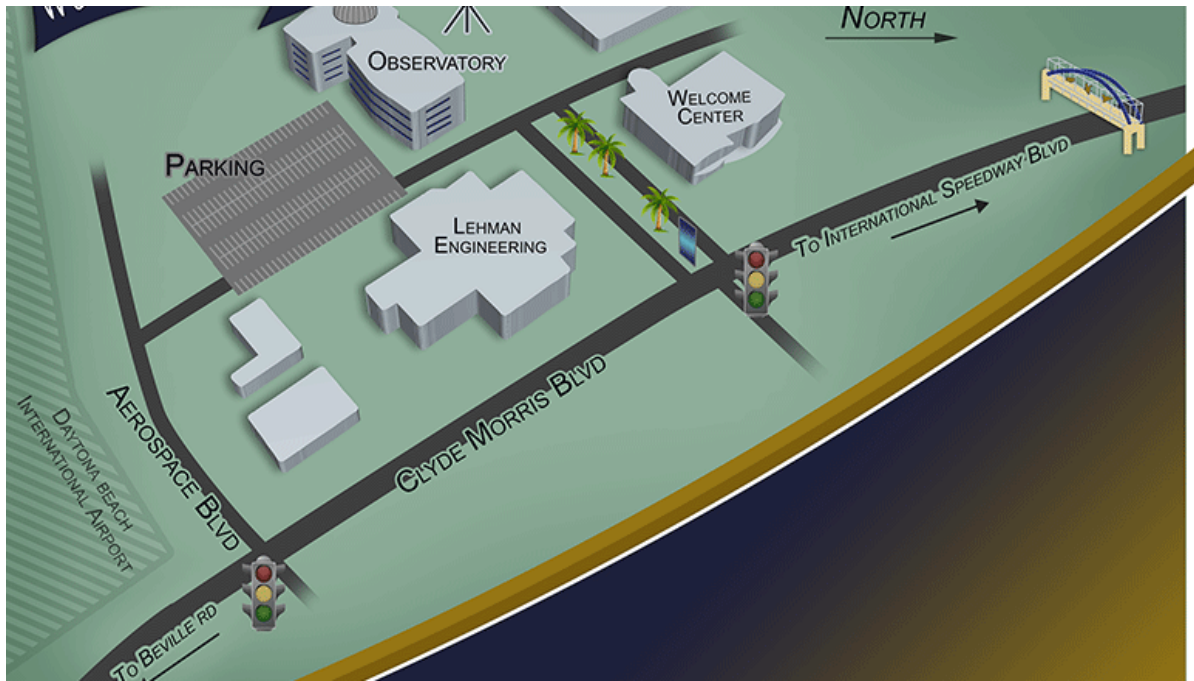
OUR PRESENTERS

Dr. Patrick Currier, Professor and Associate Chair of Mechanical Engineering, who gave our November-December presentation and Brandon Carrier, a current MSME student who finished his BSEE from Embry-Riddle last year. He will talk about the project, and then take us to the lab to show us the vehicle.

MEETING VENUE

The presentation is in the Lehman Engineering Building, room LB267, on the Embry-Riddle campus, **600 S. Clyde Morris Blvd, Daytona Beach**. Location of the Lehman Engineering building on the Daytona Beach Campus is shown below.

This will be both a presentation and tour so it will only be a face-to-face meeting.



Contact Al Jusko, a.jusko@ieee.org or 386-671-3706 for information.

LIFE MEMBER AFFINITY GROUP

The Life Members Affinity Group will have a meeting on Feb. 3, 2022, in New Smyrna Beach. The Sugar Works Distillery is a family-owned craft distiller of Rum, Moonshine and Whiskey. Their products are made in small batches with locally sourced material. They utilize time honored traditions to create specialty spirits and offer daily tastings and tours. The tour will go through the entire process of making spirits, from dry ingredients to bottling.

The owner, Tom McPeck, is a scientist, and former leader of an agricultural software company that used lasers to help citrus growers predict upcoming harvests.

Ron Gedney, LF, LMAG Chair

ANOTHER TALE FROM THE OLD PROFESSOR

FAMOUS BRIDGES

If you were to select a person at random and ask him or her to name some famous bridges you would get answers such as Brooklyn Bridge, London Bridge, Golden Gate Bridge and maybe even the Bridge over the River Kwai. Now, let's take a different approach and ask an electrical engineer if he or she is familiar with the following bridges: Maxwell, Schering, Hay, Owen or Wien. An engineer might recognize the Wien bridge. The German-speaking Viennese call their city Wien but the Wien bridge has nothing to do with that fair city but is named after its inventor, Max Wien, a German. The Wien bridge did attract the attention of William Hewlett and David Packard in 1939. It was used for their first successful product; the HP200A audio oscillator which they designed and produced from a Palo Alto garage.

The electrical bridges cited are variations of the basic bridge originally invented by Samuel Christie in 1833 but perfected by Charles Wheatstone.



The Leeds and Northrup Wheatstone bridge. This is how resistance was measured to 4 significant figures before digital meters. Notice the “ABS.” below the galvanometer. A challenge to my primarily “older” readers: What did it stand for? Hint: when I was an undergraduate physics major, a lot of our older lab equipment was designated “ABS”.



In spite of the title, this Tale is not about bridges but about Charles Wheatstone. (You can never judge a book by its cover.) If you were to ask a concertina player about Wheatstone you are pretty much guaranteed a response.

Musicians who play the accordion or concertina know Wheatstone very well and it's not for the electrical bridge. Charles invented the classic “English Concertina”. A concertina or “button box”, differs from the modern accordion in that it has buttons for the treble and bass whereas a modern accordion has buttons for the bass but a piano-like keyboard for the treble. The fact that Wheatstone is indelibly linked to the bridge that bears his name has hidden his other accomplishments.



“But wait; there’s more!” as the TV hucksters say. Wheatstone had numerous inventions involving optics, other musical instruments, electrical generators, time keeping, telegraph and cryptography. The latter, his Playfair Cipher, was created in 1854 and was a vast improvement over the encrypting codes of the era. It was used by several nations during WWI and even by the British as late as WWII. Lord Playfair promoted the use of the cipher but did not contribute to its actual development which was the sole handiwork of Wheatstone. Modern computer technology can crack the code instantly. Even WWII decrypting computers could crack the code in short order. The advantage of Playfair was it required no equipment other than pencil and paper to encode and decode. Its weaknesses were understood during both World Wars and it was only used for low sensitivity

messaging.

Wheatstone’s telegraph, which he developed with the entrepreneur William Cooke and patented in 1837, has been mostly forgotten. The two, with Wheatstone providing the majority of the “science” for the project, used 5 pointers, needles, which is akin to a galvanometer for the telegraph. The needles could point to the left or right in addition to its straight up resting position. A total of 30 different characters could be transmitted with this system. Numbers were not included in the character set and had to be spelled out.

The Cooke-Wheatstone telegraph actually predated Morse’s telegraph but the latter became the international standard and the Cooke-Wheatstone telegraph slipped into obscurity. The advantage of the

Cooke-Wheatstone telegraph was it did not require a trained telegrapher.

Wheatstone also devised methods of measuring short time intervals and measured “the velocity of electricity”. Fizeau used Wheatstone’s method to measure the speed of light within 5% of the true value in 1849. For his achievement, a lunar crater on the far side of the moon was named after Fizeau.

Alas, Wheatstone, in spite of his many contributions to science and music, never got a lunar crater named after him. He is primarily remembered only for his bridge and concertina.

Dr. Al Helfrick, a.k.a. The Old Professor

PE CORNER

The Steps to Professional Licensure, Part 2

In a recent column I discussed the beginning of the route to get your Professional Engineer license; taking the FE exam. This month I will focus on the next step, experience required and being an Engineering Intern (EI).

If an EI graduated with 4-year engineering degree, they must obtain 48 months of experience to qualify to apply to be a PE. The Florida Legislature recently changed the law such that an EI graduating with an approved Engineering Technology degree will need to complete 72 months of experience before being qualified to apply to be a PE.

What qualifies as experience? The type of employment considered acceptable must principally involve activities in the field of engineering as defined in *Section 471.005(7), F.S.* What qualifies as “experience” is found in *61G15-20.002, F.A.C.- Experience*. Some criteria considered for meeting the 48-month requirement includes:

- Experience that logically follows and incorporates an application of the engineering education previously obtained.
- Full-time experience obtained within 2 years of completing the engineering degree, that involves tasks and responsibilities consistent with the disciplines of engineering. Pre-graduation experience credit may be awarded at 50% of actual time, with total allowable credit for pre-graduation experience to not exceed 12 months.
- Experience on engineering projects that is progressive in nature, indicating an increase in quality and involving greater responsibility.
- Experience gained under the supervision of a licensed professional engineer.
- Experience gained in engineering research and design projects by members of an engineering faculty where the program is approved by the Board.
- Experience that includes demonstration of a knowledge of engineering, mathematics, physical and applied science, properties of materials, and the fundamental principles of engineering design.
- Experience that includes demonstration of the application of engineering principles in the practical solution of engineering problems.

Additionally, an applicant must list three (3) personal references who are professional engineers. These references cannot be the same individuals used to verify employment and experience.

To learn more about the examination and application process for the FE and PE exams go to the *Application Process* page under the *Licensure* section of FBPE's website at www.fbpe.org. If you have questions related to qualifying experience, contact the Board office at (850) 521-0500 and ask to speak to someone in the *Licensure* department.

Next month I'll discuss the final step to licensure, the PE exam.

Whether you are a PE looking to attain required CEHs, or an engineer looking to learn something new or keep current with the latest trend in the profession, IEEE has seminars that will meet your needs.

Art Nordlinger, PE, Senior Member

DAYTONA SECTION SHIRTS



We are pleased to offer Daytona Section polo shirts for our Section members. The shirts are embroidered with the IEEE Logo and DAYTONA SECTION on the left and your name and grade, if desired, on the right. The shirt is a high quality 5 oz, 65/35 poly/cotton pique in Royal Blue with white embroidery. Available in S - 2XL in men's as well as ladies' sizes. Price is \$35, including tax, for S-XL size's, 2XL size is \$3 additional.

For more information or to order shirts contact: Allan Jusko 386-671-3706 or a.jusko@ieee.org

FUTURE MEETING DATES

2022 Section meetings, depending on the coronavirus situation at the time:

Spring semester: Feb 24, Mar 24, Apr 28

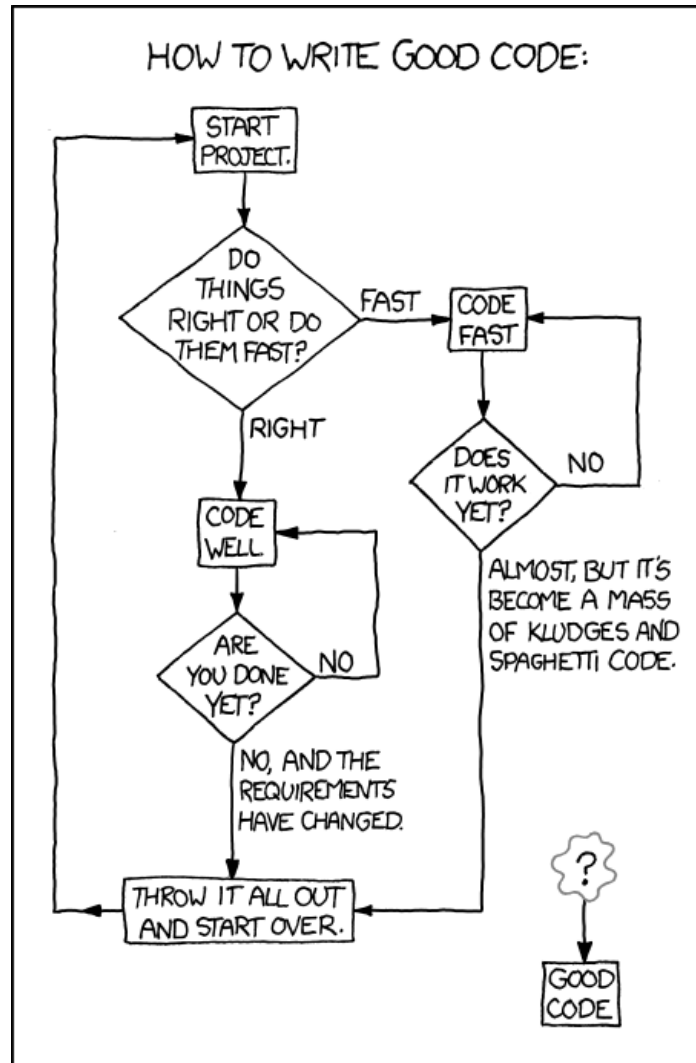
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ENGINEERING HUMOR



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