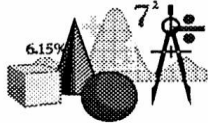




SPARKS

Daytona Section Newsletter
April 2019



APRIL SECTION MEETING

Thursday April 25th at the Halifax River Yacht Club, 6:00 PM
331 South Beach Street, Daytona Beach, Florida 32114

PRESENTATION

ERAU Student Presentations
Tomoka Science Fair IEEE Award Winners

CHAIR'S REPORT



This is a busy time for Florida. In my town, New Smyrna Beach, the population swells at this time of year to three times what it is when we have mostly permanent residents here. This week, I heard a lot of complaints about the traffic.

We also have a lot of things going at IEEE during this time of the year. Earlier this month, our Life members were given an outstanding tour of the American Radionic Company in Palm Coast. The state of the art technology used at AmRad and the gracious company personnel made this an unforgettable event for me.

IEEE stands for the Institute of Electrical and Electronic Engineers. Our section, the Daytona Section, is part of Region 3 of the IEEE. SoutheastCon is the annual conference for Region 3, and the conference was held in Huntsville, Alabama, this year. I attended SoutheastCon, which ended on April 14th.

The next Daytona Section meeting is on Thursday, April 25th. Each year, our Section provides two awards for the Tomoka Science Fair, one each for the Junior division and Senior division. At this April meeting, we will honor the recipients of our IEEE 2019 awards. The winners of both the Senior and Junior Divisions have agreed to attend and give a short overview of their projects. Then the teams from ERAU and Bethune Cookman will talk about their robots, and what they learned from participating in SoutheastCon. These are brilliant students who have done creative and interesting things that will change our future.

If you are interested, you are invited to attend this and all of our other meetings. You can find lots of information on our April meeting in this newsletter. Come join us at the Halifax River Yacht Club.

Rich

MARCH'S PRESENTATION

Dr. Helfrick's presentation was his usual eclectic mix, was unscripted and cannot be repeated. April's presentation was about our Country's President's, politicians and famous people who either were engineers or non-engineers who discovered or were credited with making engineering innovations. It was truly an interesting and informative presentation.



Section Vice Chair Helen Hernandez presenting Dr. Helfrick with the prestigious Daytona Section Travel Mug

APRIL'S PRESENTATION

As usual for our April meeting, students from ERAU and B-CU will do presentations of their senior projects. In addition, our Daytona Section special award winners at the 2018-2019 Tomoka Science and Engineering Fair will be introduced to our membership and give a short presentation of their winning project.

ANOTHER TALE FROM THE OLD PROFESSOR

NEGATIVE DELAY LINES

Most electrical engineers are introduced to the three basic passive circuit elements; resistors, capacitors and inductors early in their education. These are excellent learning tools for understanding transient and AC circuits. Resistors, of course, are measured in units of resistance or ohms. Inductors are quantified by henries and capacitors by farads. Professors in lecture and homework assignments never suggest negative resistance, negative inductance or negative capacitance. Negative resistance, as an example, suggests that an RC or RL circuit has a negative time constant and the exponential charge or discharge waveforms propagate in negative time.

Negative resistance can be created with electronic circuits and are used in oscillators as an energy source rather than a positive resistance being an energy sink. This technique has been used in microwave oscillators for years.

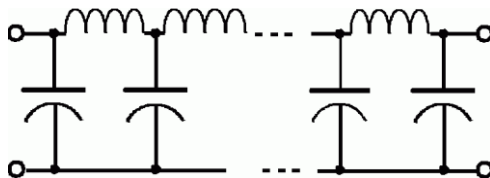
Negative capacitance and negative inductance pose some interesting questions. What happens when one uses, say, a negative inductance in a resonant circuit? Negative inductance and capacitance are relatively easy to create using a negative impedance converter and does have some applications.

But what happens if you create a delay line using negative impedance elements? Passive hardware delay lines are essentially transmission lines, either real physical coaxial cable or synthesized using inductors and capacitors. In synthesizing a transmission line, we have the opportunity to use our negative inductors and capacitors. This means it would have a negative time delay and an input comes out before it went in.

That is truly a handy device. Imagine if you made a one-second delay line and ran video through it. Now we feed the input from a video camera mounted on the dash of our car. We can see what is going to happen one second from now. "Is that car at the stop sign going to come out and cause an accident or wait until I pass?" We would have a one-second warning allowing us to brake before a possible collision. There would be many applications for a negative delay line.

Over the years I have read articles in scientific and trade journals that were so fantastic that I checked to see if I was reading the April edition. In some cases, I was.

This Tale was written on April 1, 2020. That's right; a year from now. You see, I fed this Word file in to a one-year negative delay line. Before you start talking about non-causal systems, blah, blah, etc., check the month of this Newsletter.



INPUT April 1, 2020

OUTPUT April 1, 2019

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

PE CORNER

ENGINEERING WORK THAT REQUIRES LICENSURE

Section 471.005(7) defines “Engineering” as “any service or creative work that requires engineering education, training, and experience...”. I won’t repeat it verbatim here as the first sentence alone is 165 words long. The service or creative work includes “...consultation, investigation, evaluation, planning, and design...inspection of construction...work, either public or private in connection with utilities, structures, buildings, machines, equipment, processes, work systems, projects...insofar as they involve safeguarding life, health, or property...”. A mouthful even in summary.

Section 471.033 Disciplinary Proceedings has the board investigate and discipline anyone who practices Engineering or offers Engineering services without a valid license and provides penalties for such activities.

There are some engineering activities that may be performed by someone who isn’t licensed, delineated in Section 471.003(2) of the Florida Statutes. In summary, these include:

- Doing work on your own property that would otherwise require a PE, so long as it doesn’t affect the public.
- Government employees doing projects valued under \$10,000 and subordinates of government-employed PEs.
- Manufactured product design and fabrication.
- Engineering work by public utility employees (electric, telecommunications, etc.)
- Subordinate employees of PEs assisting in engineering work.
- Contractors executing work designed by a PE
- Electrical, plumbing air conditioning and mechanical contractors doing projects smaller than certain defined thresholds.
- Work done by defense, space and aerospace company employees
- College engineering instructor’s teaching activities

However, for engineers whose work falls into these exempt categories, that may not be the whole story in terms of whether they need to be licensed. For example, some companies, though their work is technically exempt, require that an engineer be licensed as a condition for promotion above a certain grade, just as they may require an advanced degree for certain jobs. Or licensure may be a “desired” attribute for a candidate, if not “required”. Having a license may put a candidate for promotion “ahead of the pack” as a result. Many college professors do consulting work in addition to their teaching responsibilities and this may require licensure as well. Thus, even engineers working in “exempt industries” may find that licensure is desirable or even required, even though it isn’t part of their day-to-day work.

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

Art Nordlinger, PE, Senior Member

LIFE MEMBER NEWS

The Life Members Affinity Group participated in a tour of the manufacturing facility of American Radionics Co., Inc. (AMRAD) on April 2, 2019. Vice President Richard Stockman hosted our tour with participation from other senior staff.



AMRAD makes large capacitors using a thin film of polypropylene as the dielectric. They have devised a simple, yet elegant, method for making at least seven capacitors in one casing. They target markets where they can “make a difference” and be competitive with off-shore manufacturers. They continue to devise new solutions for special markets.

They build most of the manufacturing tools themselves, with the exception of the web handling tools that wind the capacitors. They have very good quality control throughout the facility and their product is extremely stable. They test the product well above its specified ratings.

Management is very proud of their factory workers (they employ about 60 people), and the workers seemed very content with their jobs. Right now, they work one shift/day, and they are quite busy.

We really appreciated the superb tour, discussions regarding their production processes, and talking with their laboratory people. Company management went out of their way to give us a superb tour and a well spent afternoon.

Ron Gedney
Chair, Life Members Affinity Group.

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 \$30, 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:

The dates for the fall session are: Sep 26, Oct 24, and Nov 21

EDITORS NOTES

Visit our Daytona Section website: <http://ewh.ieee.org/r3/daytona/>

© Randy Glasbergen
glasbergen.com



"I'm no expert, but I think it's
some kind of cyber attack!"

2019 SECTION OFFICERS

Chair – Richard Kent

206-369-1965 rtkentjr@msn.com

Vice Chair – Helen Hernandez

386-872-0483 hhernandez@ieee.org

Treasurer - Dr. Jianhua Liu

386-226-7713 liu620@erau.edu

Secretary – Ron Gedney

386-847-8094 r.gedney@ieee.org

Awards Chair – Dr. Keith Garfield

386-226-7081 garfielk@erau.edu

Publicity/Media – John Horner

201-240-6689 jhorner@gmail.com

PACE Representative – Dr. William Barott

386-226-8973 barottw@erau.edu

Life Member Chair – Ron Gedney

386-478-1204 r.gedney@ieee.org

Vice Chair – Martin Oksenhorn

moksenho@yahoo.com

Computer Society Chair – Dr. Keith Garfield

386-226-7081 garfielk@erau.edu

Student Activities, (Co-Chairs)

ERAU - Dr. Keith Garfield

386-226-7081 garfielk@erau.edu

B-CU - Dr. Xiaohe Wu

wux@cookman.edu

ERAU Student Chapter Chair- Victoria Rutenbeck

Rutenbev@my.erau.edu

B-CU Student Chapter Chair – Ashim Ghimire

Ashim.ghimire@students.cookman.edu

Webmaster – Charlie Husbands

386-760-7163 chusbands@ieee.org

SRT Project Coordinator - Charlie Husbands

386-760-7163 chusbands@ieee.org

SPARKS Editor - Allan Jusko

386-671-3706 a.jusko@ieee.org

APRIL 2019 MEETING

Thursday April 25th at the Halifax River Yacht Club
331 South Beach Street, Daytona Beach, Florida 32114
Just south of the Fire Station at the corner of Beach and Orange Streets

TOPIC– Student Presentations

SPEAKERS – ERAU, B-CU Students,
Tomoka Science Fair Winners

AGENDA

5:30 PM Greetings & Cocktails
6:00 PM Dinner
7:00 PM Presentation

Dinner Menu

Italian Buffet

Members and guests \$20.00 each

Students \$5.00

IMPORTANT DINNER NOTE!

The Yacht Club is requiring us to give them a dinner count by the Tuesday afternoon before our meeting.

As always, all members and guests are welcome to attend the meeting and presentations, however any dinner requests received after Tuesday afternoon may not be accepted

Please contact Allan Jusko by Tuesday April 23rd at noon
to give us a count for dinner or for further information

If you make reservations and are unable to attend, call prior to the event to cancel.

The Section is charged for all dinners ordered, please let us know if your plans change

Allan Jusko Editor

386-671-3706