### Abstract:
Matt Wilbur will provide an overview of the FIRST programs, and provide insight as to why FIRST is critical to the future of Hampton Roads. Based on his experience as head coach, he will discuss challenges and opportunities that FIRST provides for students, educators, and practicing engineers alike.

### Biography:
MATTHEW L. WILBUR is a Senior Research Engineer for the US Army Research Laboratory (ARL) where he investigates state-of-the-art helicopter rotor system technologies. His duties include the analytical investigation of advanced rotor system concepts, and the planning, preparation, and execution of wind-tunnel tests of aeroelastically similar, model-scale helicopter rotor and tiltrotor systems in the Langley Transonic Dynamics Tunnel (TDT). Mr. Wilbur helped to pioneer the use of embedded piezoelectric-fiber actuators to impart active-twist control on helicopter rotor blades, a field of study that has proven application for rotorcraft vibration and noise reduction. For this research, he received the 2001 ARL Achievement Award for Engineering.

In 2007, Mr. Wilbur volunteered to start and coach a FIRST Robotics Competition team, Triple Helix, at Menchville High School in Newport News, Virginia. Now entering their 8th season of competition, Triple Helix has become one of Virginia’s most successful FIRST teams, having earned numerous awards and reaching the 2014 FIRST FRC Championship Final. The team has also been active serving needs in our community and furthering the education of students with robotics summer camps, teacher workshops, and the development of a robotics class at Menchville High School. Mr. Wilbur continues to serve the team as head coach and a mechanical systems mentor.
From the Chair

Dear fellow members of IEEE Hampton Roads,

The young minds of Hampton Roads are creative and productive as seen by their valuable contributions in Student Presentation Contest. Interestingly, the next month “November” can be considered as the robotic-month for the HR Section: two speakers Dr. James Conard and Mr. Matt Wilbur will be presenting their valuable experiences on robotics on Nov. 14 and Nov. 20, 2014 respectively. And, the final event of the month will be concluded by the students of Granby High School on Nov. 21, 2014.

As we all know the success of our Section dependents on our enthusiasm and dedication, it is the time to think and join as Section chair, Treasurer and Secretary. Self nomination is perfectly acceptable. Please send your nominations to Past Chair Dr Anton Riedl (riedl@cnu.edu). I believe your involvement will enhance the service that we provide to our community. Looking forward to seeing your enthusiasm for the success of our community.

Dr. Shahid Ahmed
IEEE Hampton Roads Section Chair
shahid.ahmed@ieee.org

The 2015 nominations committee of the Hampton Roads Section seeks nominations for elected office. Section members of Member or higher grade to include the Graduate Student Members may hold elected office.

The elected officers of the Hampton Roads Section are:
- Chair
- Vice Chair
- Secretary
- Treasurer

If you know someone who should be nominated or would like to volunteer, please contact any member of our nominations committee: Anton Riedl (riedl@cnu.edu).

Call for Hampton Roads Section Nominations

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Lunch & Learn: Robotics—Quadcopter swarm formation/control

Autonomous aerial formations of multiple quadrotors can be used for payload manipulation and surveillance, but often require an external system for computation or control. By having locally controlled quadrotors, swarm applications can be realized without the limitations of an external system. In this talk, an algorithm is proposed to establish a swarm formation of decentralized controlled quadrotors. First, a method of localization and motion planning is discussed for a single quadrotor. Next, the behavior of quadrotor swarm formations with decentralized control is discussed. Lastly, the future direction of this research is explained.

Speaker: Dr. James Conrad, UNC Charlotte, IEEE Region 3 Director-Elect 2014-2015

Date/Time: Friday, November 14, 2014 12:30 PM - 2:30 PM

Location: Old Dominion University Engineering & Computational Sciences Building Room 1201
5115 Hampton Blvd., Norfolk, VA

Meal Cost: Members/Professional guests $15 in advance, $20 at door; IEEE Students: $5 in advance, $10 at door; non-IEEE Students: $10 in advance, $15 at door.
Embedded Systems Development and Future Trends

What is an Embedded System? Where are they? Is this an important field? Embedded Systems are EVERYWHERE – they are your mobile phones, automobiles, digital watches, and digital televisions. This webinar will investigate the growing field of Embedded Systems: what devices they truly include, how these systems are developed, what skills are needed to work in this field, and future trends.

Speaker: Dr. James Conrad, UNC Charlotte, IEEE Region 3 Director-Elect 2014-2015

Date/Time: Friday, November 14, 2014 6:30 PM - 9:00 PM
Location: DB Schenker Building, Oceanview Conference Room, Burns & McDonnell Offices 1305 Executive Blvd., Suite 160 Chesapeake, VA 23320
Meal Cost: $20 in advance; $25 at the door.
RSVP: Register online at https://meetings.vtools.ieee.org/meeting_view/list_meeting/29013 or with Jimmy Higgins (jimmyhiggins532@gmail.com) by 12pm Nov. 13, 2014. Indicate if Vegetarian/vegan meal will be needed.

Student Paper Presentation Results

On October IEEE Hampton Roads Held its annual Student Paper Presentations. The year’s presenters at this year’s event, in order of placement, were:
1) Quentin Morales-Perryman, Hampton U, Mishap Information Database
2) Alonzo Jenkins, NSU, Impedance of a Coil in Seawater
3) Nigel Armstrong, CNU, Safety in Unmanned Aerial Systems
4) Jason Harris, ODU, Discharge Characteristics of Lithium Polymer Batteries

The 31st International Review of Progress in Applied Computational Electromagnetics (ACES 2015)

March 22-26, 2015, Williamsburg Lodge, Williamsburg, Virginia 23185, USA
General Chairs:
C. J. Reddy, Altair Engineering, Inc. / Applied EM, Inc.
Khaled ElMahgoub, Trimble/MIT

The International Applied Computational Electromagnetics Society (ACES) Symposium serves as a forum for developers, analysts, and users of computational techniques applied to electromagnetic field problems for all frequency ranges. The symposium includes technical invited plenary and regular presentations, software tutorials, vendor booths, and short courses. ACES 2015 conference will be held in Williamsburg Lodge in Colonial Williamsburg from March 22-26, 2015. Call for papers can be found on ACES 2015 web site - http://www.aces-society.org/conference/2015/. Plan to contribute papers as well as attend the conference. Sponsorship opportunities are also available. ACES 2015 is technically sponsored by IEEE Antennas and Propagation (AP) Society as well as Electromagnetic Compatibility (EMC) Society. Proceedings of ACES 2015 will be published in IEEE Xplore. For further information, please contact Dr. C. J. Reddy (cjreddy@altair.com)

Dr. Irwin Jacobs to Speak at William & Mary School of Business

Dr. Irwin Jacobs, an IEEE Medal of Honor recipient will be speaking to Students at the College of William & Mary’s School of Business on November 7th. The presentation will begin at 2:00 PM school’s 2nd floor big room.
Dr. Jacobs is the Founder with Dr. Viterbi of Linkabit and Qualcomm.
If you would like to attend please contact Bert Aaron [ka1abj@cox.net] by November 4th. Parking is limited.
Attached is the announcement Dr. Jacobs receiving the IEEE Medal of Honor.
IEEE Medal of Honor
Sponsored by the IEEE Foundation

Irwin Mark Jacobs

For leadership and fundamental contributions to digital communications and wireless technology

A pioneering engineer and visionary business leader, Irwin Mark Jacobs has played a central role in advancing modern digital communications with revolutionary innovations critical to the development of today’s wireless communications systems. From his beginnings as a communications theorist, Dr. Jacobs’ success lies in his ability to take ideas that advance digital technology from theory to practice and successful commercialization. As a co-founder of technology companies that have provided important innovations, Dr. Jacobs has played a key role in the shift from analog to digital communications experienced during the past 40 years. Dr. Jacobs co-founded Qualcomm, Inc., in 1985 and grew it from a small technology firm to a Fortune 500 company. He helped lead revolutionary developments such as the Code Division Multiple Access (CDMA) technology that greatly improved cellular communications efficiency compared to analog systems. Dr. Jacobs overcame the initial skepticism and controversy involved with introducing the new technology and guided CDMA to successful implementation and standardization. CDMA would become the foundation of third-generation (3G) wireless systems. Dr. Jacobs was also instrumental in Qualcomm’s development of a satellite communications and tracking system for the trucking industry. Using spread-spectrum technology, advanced signal processing, and innovative antenna designs, the system provided the first two-way communication and positioning system for fleet management. Known commercially as OmniTRACS, the system is still in use around the world today. Prior to Qualcomm, Dr. Jacobs co-founded LINKABIT Corporation in 1968, which provided innovative semiconductor technology and programmable devices that were important to the development of satellite-to-home television services. While at the Massachusetts Institute of Technology, Dr. Jacobs co-authored (with John Wozencraft) Principles of Communication Engineering (Wiley, 1965), which is considered one of the best communications theory textbooks ever written and is still in use today.

An IEEE Life Fellow, former chairman of the U.S. National Academy of Engineering, and Fellow of the American Academy of Arts and Sciences and American Association for the Advancement of Science, Dr. Jacobs’ many honors include the U.S. National Medal of Technology (1994) and the inaugural IEEE Vehicular Technology Society Hall of Fame Award (2009). Dr. Jacobs is founding chairman and Chief Executive Emeritus of Qualcomm, Inc., San Diego, Calif.

Scope: For an exceptional contribution or an extraordinary career in the IEEE fields of interest.
Girls in Engineering
How one public school defied the odds and made history

By: Deborah Marshall, Department Chair: Career & Technical Education Department, Granby High School, Norfolk, VA & Roger Lagesse, Technology Teacher, Career & Technical Education Department, Granby High School, Norfolk, VA

The following young ladies are returning members of the Girls In Engineering program for the 2014-15 school year.

- Vanessa Collada: 10th Grade: Has been with the program since its inception 3 years ago.
- Victoria Gormley: 12th Grade: 2nd year with the program
- Lauryn Tidoe: 10th Grade: 2nd year with the program

All other young ladies participating are 1st or 2nd year members of either the after school program or the classes.

How do you get more girls involved in technology and engineering courses?

For the last few years, that was the question making the rounds at Career and Technical Education department meetings across Virginia. In the Fall of 2012, Roger Lagesse and Deborah Marshall answered that question by starting a program to inspire more high school girls to enter Granby High School’s Engineering Program.

In October 2012, all girls interested in engineering were invited to an IEEE Women In Engineering presentation by Hampton Roads Section Chair and Region 3 PES Chapters Representative Jennifer Ammentorp, Hampton University IEEE Student Branch President Erin Lawler, and Hampton University Society of Women Engineers Student Section President (and IEEE Student member) Karissa Vaughn. These three women were an informal panel that enlightened the fifteen attendees about STEM Careers and how to select the right courses in high school to prepare for college in support of a STEM Career.

After that, we announced on the school’s main foyer and electronic bulletin board, the forming of the Girls In Engineering after school program. On November 19, 2012, it became a reality when six girls showed up in Mr. Lagesse’s room. This program would introduce the girls to various aspects of engineering by having them design, build, and troubleshoot an underwater Remote Operated Vehicle (ROV). This activity allowed the girls to enter their robot, named Pippy after Pippy Longstocking, in the Marine Advanced Technology Education (MATE) ROV competition in April 2013.

Through the MATE ROV the girls were challenged with a real world situation. The MATE Center uses underwater robots – also known as remotely operated vehicles or ROVs – to teach science, technology, engineering, and math (STEM) and prepare students for technical careers. Working in partnership with the Marine Technology Society ROV Committee, MATE created the ROV competition as a way to:

- Engage students in STEM and expose them to science and technology careers
- Encourage students to develop & apply technical, teamwork, & problem solving skills
- Provide funds, materials, & technical expertise to support student learning

By being the first all-girl team to participate in the competition, the girls and their robot, Pippy, made history. They placed 6th out of 14 in the 2013 Mid-Atlantic Regional Competition.

Also, as part of the program, the girls participated in National Engineers Week. On February 21, 2013 the Girls In Engineering after school program participated in National Engineers Week and Shadow An Engineer Day by spending the day at HRSD’s Virginia Initiative Plant.

As a result of this after school program and the girl’s enthusiasm, Granby High school was able to bring on a "Girls Only" first year engineering class for the 2013-14 school year. The "Girls Only" first year engineering class has far exceeded our expectations. Twenty-two young ladies enrolled and there was a waiting list.

The Girls in Engineering course was a class to introduce girls to the world of engineering. To accomplish this the teacher

- Engages students in STEM and expose them to science and technology careers
- Encourages students to develop and apply technical, teamwork, and problem solving skills
- Provides funds, materials, and technical expertise to support student learning
Effectiveness:

For the 2013-14 school year, the new course was brought on and the after school program continued and grew to seven girls. Once again, the Girls In Engineering After School team designed, built, and troubleshooted an underwater ROV. At the MATE ROV Competition on April 26, 2014, the ROV, Pippy 2.0, and the team once again made history. They received the award for “Best Engineering Evaluation”, placed 2nd out of 14 overall and qualified for the MATE ROV International Competition in Alpena, MI on June 26-28, 2014.

Emails were sent, presentations were made, doughnuts were sold, and the money was raised. On June 25, Roger and his wife Jeanne set off with Pippy 2.0 on the back of their pickup truck for Alpena, MI. The next morning, Ms. Marshall and the all-girl team flew to Alpena, MI where everyone met up at the airport. When roll call was completed the next day, once again the team had made history by being the first all-girl team to compete at the International level. They placed 27th out of 550 Ranger teams worldwide.

As for the 2013-14 first-year engineering class, 63.6% of the students completed the class with a grade of a C or better, 27.3% earned an A.

Overall, the “Girls In Engineering” after school program allows the Girls to:

- Develop their self-confidence in engineering
- Demonstrate creativity and innovational abilities.
- Think critically, solve problems and make decisions.

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For the 2014-15 school year, Granby High School will be bringing on a “Girls Only” second year engineering class. Both the Girls In Engineering: after school program and