



ION Saint Louis

SPRING 2015



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Chair's Column

Saint Louis Section of IEEE

Chair's Column, February 2015

The St. Louis Section of the IEEE completed the 2014 events with the Winter Social on December 6th. The Section had one of the larger turnouts in our recent history of us hosting the Winter Social. We presented a number of outstanding awards as well as recognitions to many of our amazing volunteers and members in our Section. I would like to thank all those that volunteered their times and resources in helping us plan and host events throughout the past year.

As I look forward to this year, I am again thankful to all those that have agreed to take upon volunteer roles for 2015. Our Section needs your help in accomplishing many events that we have planned for this year. If you are interested in filling one of our vacant committee chair positions or want to be involved in our Section in some other ways, please contact the Executive Committee at sec.stlouis@ieee.org. The St. Louis Section Executive Committee for 2015, responsible for planning, executing, and governing of the Section is comprised of:

Chair- Prakash Shahi

Past Chair- Paul Min, PhD

Vice Chair-Yoelit Hiebert, PE

Treasurer-Prasenjit Shil, PhD

Secretary –Maciej Zawodniok, PhD

Chair's Column

Over the past year, a group of St Louis University students has volunteered their time with editing the newsletter for our Section. I want to commend the group on the quality of their editorial work on the past issues and look forward to the continued quality on future issues.

We kick started the new year with the audit of the Section finances in January. In February, we will be participating in the Engineers Week luncheon and are sponsoring a Student paper competition on Feb 14th. We are also planning on a student robotics competition in March. For our professional members, we are planning on plant tours as well as workshops like the lean training in the fall.

We are setting up a new Committee this year to explore strategic planning for the Section. The Strategy Planning committee will be chaired by Bob Becnel with Yoelit Hiebert and Prasenjit Shil participating from the executive committee. I look forward to recommendations from this committee as they move forward in the next few months.

I am extremely happy to be serving as your Section Chair for 2015 and look forward to meeting all of you at our Section events this year.

Thank you,

Prakash B Shahi

Chair, St. Louis Section



IEEE St Louis Section News

2015 IEEE REGION 5 AWARDS CALL for NOMINATIONS

IEEE has just begun accepting nominations for the following awards!

- #001 Outstanding Large Section (>500 members)
- #002 Outstanding Small Section (<500 members)
- #003 Outstanding Member
- #004 Outstanding Educator
- #005 Outstanding Large Student Branch (>50 members)
- #006 Outstanding Small Student Branch (<50 members)
- #007 Outstanding Student
- #008 Outstanding Student Branch Counselor
- #009 Outstanding Large Company (>500 employees)
- #010 Outstanding Small Company (<500 employees)
- #012 Outstanding Young Professional Member
- #013 Outstanding Individual Achievement Award (up to 5 awards)

A short description of each award and nomination forms will be posted on the Region 5 Website (ieeer5.org/awards)

Please send nominations to the Region 5 Awards & Recognition Committee Chair, Steve E. Watkins, steve.e.watkins@ieee.org, with the following subject:

"IEEE R5 Award Nomination # [Award Type]"

Nominations must be submitted using the Word forms available. The deadline for nominations is **February 13, 2015**.

Please address any question to the R5 Awards & Recognition Committee Chair:

Steve E. Watkins

573-341-6321

steve.e.watkins@ieee.org

IEEE St Louis Section News

Welcome New Fellows to IEEE Saint Louis Section!

Sajal Das

Missouri University of Science and Technology
Rolla, MO, USA
for contributions to parallel and distributed
computing

Zhihai He

University of Missouri, Columbia
Columbia, MO, USA
for contributions to video communication and
visual sensing technologies

Yahong Zheng

Missouri University of Science & Technology
Rolla, MI, USA
for contributions to channel modeling and equaliza-
tion for wireless communications

David Pommerenke

Missouri University of Science and Technology
Rolla, MO, USA
for contributions to system-level electrostatic
discharge technology

Notification



The Saint Louis Section will hold a Section Planning Meeting on Monday, February 16, at 6:30 pm at the Saint Louis University Parks College conference room. All members are welcome to attend.

IEEE St Louis Section News

Fundamentals of Lean Training

This day long training was co-sponsored by Ameren and IEEE St Louis section and was hosted by Ameren on Nov 8, 2014 at its General Office Building in downtown St Louis. The training was designed to provide a basic understanding of how Lean Continuous Improvement concepts are intended to function and help the organizations gain efficiency by reducing waste. Roughly 40 participants from both academia and industry attended this training. The training was conducted by experienced Lean trainers from Ameren. The Lean concepts introduced in this training program were derived from the Toyota Production System (TPS). However, it addressed all functions of work, not just manufacturing. The participants were introduced to various lean tools, engaged in lean simulation games and learnt to use value stream mapping. The lean trainers were facilitated for their contributions by IEEE St Louis section at the Winter Social 2015.



IEEE St Louis Section News

Check out our pictures from the Winter Social 2014!



IEEE St Louis Section News

Winter Social 2014

Saint Louis University's student branch of the Institute of Electrical and Electronics Engineers (IEEE) attended the annual St. Louis IEEE Winter Social on Dec. 6, 2014.

More than 20 Parks College students joined Professor and Chair, H.S. Mallik, Ph.D., Assistant Professor Armineh Khalili, Associate Professor Roobik Gharabagi, Ph.D., and Associate Professor William Ebel, Ph.D. at the Winter Social.



Parks Students and Faculty Gather at the IEEE Winter Social

Student Branch News

Bastian Solutions Tour

This past fall, IEEE had the opportunity to tour Bastian Solutions Robotics facility in Maryland Heights. Bastian specializes in integrated automation systems for industry production. Student members met field engineer, Rick Mortensen, at the IEEE Winter Social last year leading to the invitation. Rick discussed the projects and customers that Bastian typically works with and other company departments of Bastian Solutions. Afterwards the students were led on a tour of their production facilities. Robots in the manufacturing process were seen as well as their testing areas. A live demonstration of a pallet unloader was done to showcase the final product. Different systems were discussed as well to show the variety that Bastian deals with and can specialize robots for. Students were encouraged to participate and ask questions, exploring the robotic automation industry. Other engineers from Bastian were engaged in the tour as well to explain their projects and answer questions. Overall students had a great experience and were very impressed by the work being done. The tour and information session were excellent, giving students a look into what they could potentially be doing one day in the industry. Special thank you to Rick Mortensen and Katie Foster for coordinating the tour!



Student Branch News

Billiken Bots

As a part of Make a Difference Day (MADD) at Saint Louis University, IEEE held its second annual BillikenBots event made possible by sponsorship from the Saint Louis Professional Section of IEEE and Region 5 of IEEE. Hosting members of the Junior Academy of Science (JAS), BillikenBots offers middle school and high school students a glimpse of what engineering and STEM fields have to offer. Over 60 students from the St. Louis area came out for the event, from Barnhart and Belleville, O'Fallon and Ferguson, from St. Louis City, University City, Rockwood, Parkway. Students were from private schools, public schools and home schooling. Peggy Nacke, Director of Special Projects at JAS, say "The students in Grades 6-10 came to Billiken Bots because of their common love for science. Ninety six percent of these students did not know anyone in the group - they just wanted to spend a morning building a light-powered robot!"

The students were presented the challenge of building a light-sensitive robot using circuit board components easily purchased from electronics suppliers. Once robots were functioning and trouble shooting was done, participants raced each other for a grand champion of the day. Afterwards, engineering students held a panel for participants to ask questions. There was a lively discussion on engineering and all that the industry opportunities a STEM degree offers. The day was a fun-filled experience for students and volunteers alike! Volunteers from the IEEE SLU student branch were assisted by the freshmen Engineering Learning Community, SLU's chapter of the Biomedical Engineering Society (BMES), and members of the National Society of Black Engineers (NSBE). Bringing together the students with ice-breakers in the rotunda, actively aiding participants during the building phase, coordinating healthy competition with robot races, and answering questions about their academic experiences and career choices, volunteers created an exciting atmosphere throughout the day. A special thanks to the event's sponsors:

IEEE St. Louis Section and Region 5

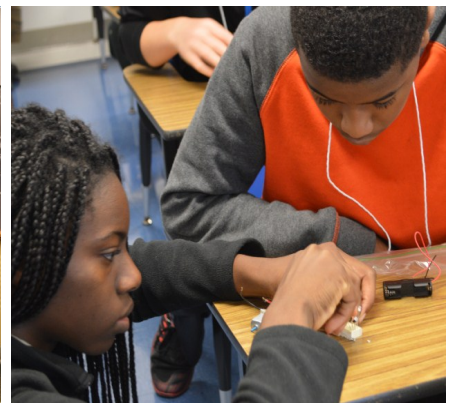
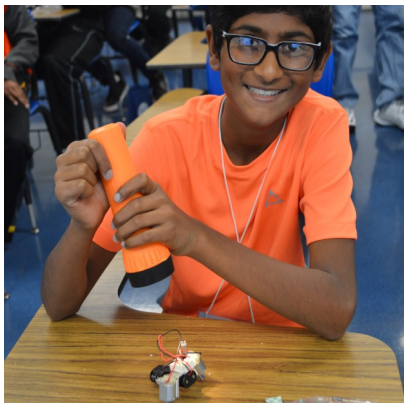
Junior Academy of Science through the Boeing Employee's Fund

Saint Louis University and Parks College of Engineering, Aviation and Technology

Student Branch News

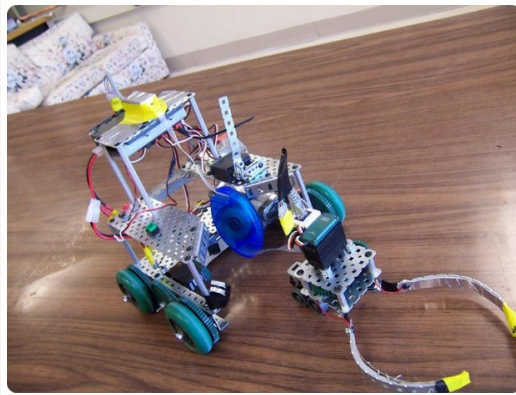
Billiken Bots

Check out our pictures from Billiken Bots!



Student Branch News

The Missouri S&T Student Branch



At Missouri University of Science and Technology, the IEEE Student Branch strives to help members gain valuable technical and professional skills, as well as friendships, by offering many opportunities of involvement. Some of the technical activities include Electronics Workshops, where students work on fun projects like making their own USB oscilloscope. A department picnic was hosted that brought together students and faculty for not only fun, but to help gain networking skills. To build a sense of community for students, the branch also hosts Open Labs, where students can get to know each other, get help on projects, and learn about the benefits of IEEE. The Missouri S&T IEEE Student Branch is excited to continue offering these activities, and many more, to help students grow.

Student Branch News

Black Box Competition

On November 15 SLU student members participated in the IEEE black box competition located at Missouri S&T. The Black-box Competition required contestants to identify the components within the "blackbox," which could be interconnections between diodes, transistors, capacitors, inductors, etc. With only 3 hours to complete the challenge, this competition tested their knowledge of electronics, signal processing, frequency response, dynamic component knowledge, and their engineering problem solving skills. Teresa Lanuza says, "The main challenge we encountered during the competition was not being familiar with the equipment in Rolla." Lanuza adds that even though she wasn't able to properly practice for the competition, she applied the techniques and knowledge she learned in previous classes at SLU which helped her identify the blackbox components. For this challenge teams consisted of one or two members were given two to three hours to determine the contents of a closed box and predict the functionality of the circuits within the box. The teams were then asked to outline their investigative probing in a report.



At the end of the competition, judges from local industries and faculty members from participating universities reviewed the reports and provide their judgment of the students' performances. After a total of ten teams competed against each other the votes were tallied and slU students were able to take home both first place as well as third! The first place winners were Marie Lappe and Meagn Depew-Brady (SLU) with the second place winner Brandon Beyers (MST) and the third place winners Emily Hart and Teresa Lanuza (SLU). We are all very excited for their exceptional performance and would like to wish all SLU teams congratulations!

Upcoming Events

2015 Saint Louis Section IEEE

Student Paper Competition

Are you interested in honing your presentation skills?

The Saint Louis Section of the IEEE sponsors the Student Papers Competition. It encourages the development of technical communication skills. The competition includes an oral presentation and a written paper related to technical, engineering, management, or societal aspects of subjects relevant to the IEEE. A cash prize will be awarded to both competitions. The Student Papers Competition is open to IEEE student members who are undergraduates (only) at the time of the local competition. IEEE student membership of all authors is required. Papers may be prepared by a single author or by a team of up to three authors (all must be undergraduates).

This competition's top 2 winners will be eligible for the North Area Region 5 IEEE Paper Competition in March 2015 and then the Region 5 Competition in April 2015. Each level has a potential to receive cash prizes. Refer to the *2015 Student Papers Competition Rules* (attached) for complete details.

Competition Dates

Papers Due: Saturday, February 7, 2015 to Prof. Bruce McMillin (ff@mst.edu).

Oral Presentation: Saturday, February 14, 2015.

Winners to be submitted to the North Area Chair: Monday, February 16, 2015.

The Oral Presentation is scheduled for February 14, 2015, tentatively at Washington University in St. Louis in Bryan Hall, Room 305.

Awards

Announced at the conclusion of the Oral Presentation. The decisions of the judges are final. Certificates are awarded to the winning papers and oral presentation on a winning entry basis (not per author) in the following amounts: \$125 (1st place entry), \$100 (2nd place entry), and \$75 (3rd place entry). The 1st and 2nd place selection will advance to the Area Competition.

Questions

Dr. Bruce McMillin, General Chair

ff@mst.edu

Office: (573)-341-6435

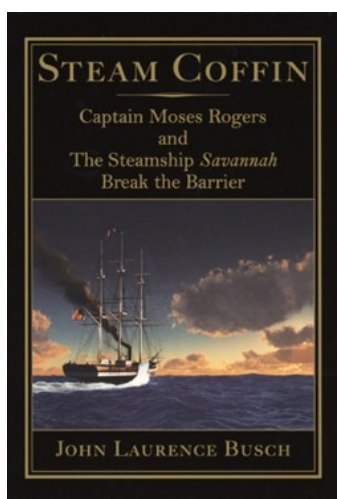
Upcoming Events

Engineer's Week

Joint Society Luncheon 2015

Building the First "Steamship" in History

by John Laurence Busch based upon his book



STEAM COFFIN

Captain Moses Rogers and The Steamship *Savannah* Break the Barrier

Historian and author John Laurence Busch will attempt to re-calibrate your mind before showing why the proposition of making the first crossing of the Atlantic Ocean on a "steamship" was met with a mixture of skepticism and fear. Then he will show how Captain Rogers addressed those fears, by designing a new kind of steam vessel, capable of overcoming the dangers of the deep. The Savannah is more than a "steamship."

She is the first example of globalized high technology in history.

www.steamcoffin.com for more reviews and background...

When: Tuesday, February 24, 2015, 11: 15 AM Registration, Noon Lunch, Program to Follow

Where: Crowne Plaza St. Louis – Clayton 7750 Carondelet Ave. Clayton, MO

Cost: \$35 per person. Group Reservations/Tables of 10 will be recognized during the event

Complimentary Parking in the 7777 Bonhomme Garage (Cross over to Hotel from Orange Level)

PAID reservations are required by Tuesday, February 17, 2015

Advanced Reservations only – No Walk-ins

Name of Organization

Address

Phone

Email Address

of Tickets

Checks payable and mailed to: The Engineering Foundation of St. Louis, 4359 Lindell Blvd. St. Louis, MO 63108

Upcoming Events

Grounding and Shielding of Electronic Systems Short Courses

(How to Diagnose and Solve **Electromagnetic Interference** and **Signal Integrity** Problems)

Presented by **Dr. Tom Van Doren**

Professor Emeritus of Electrical & Computer Engineering

Missouri S&T Continuing Education Office

vandoren@mst.edu 573-578-4193 www.emc-education.com

Additional details including cost, location, and how to register can be found at:

<http://dce.mst.edu/noncredit/facetoface/groundingandshieldingstlouis/index.html>

Course Description

Most engineers and technicians using or designing electronic systems have not had formal training concerning grounding and shielding techniques. Learning how to solve electromagnetic interference and signal integrity problems on the job can be very expensive for the employer and frustrating for the engineer. Most of the electromagnetic and circuit principles involved are simple. However, the complexity of many systems masks the logic and simplicity of possible solutions.

This course: treats signals as currents; explains fundamental grounding, shielding, and signal routing principles; clarifies troublesome terminology; and demonstrates many techniques for identifying and fixing electrical interference problems. The principles will be described as concepts rather than theoretical equations. The emphasis on concepts will make the course useful for people with a wide range of experiences. Several interference mechanisms and shielding techniques will be demonstrated.

Some of the Course Benefits

This course will help engineers and technicians to:

- Use logical procedures, more than 'trial-and-error', to reduce noise problems;
- Improve the signal integrity of high-speed digital waveforms;
- Reduce the time and cost required to meet emission and susceptibility specifications;
- Determine the optimum grounding technique for both safety and low noise;
- Recognize that all electrical interference problems are caused by four basic coupling mechanisms (conducted, magnetic fields, electric fields & electromagnetic waves);
- Determine the correct connection for the shield on a twisted pair cable.

Upcoming Events

Course Outline

Tuesday March 24

1. Introduction

Misconceptions that can cause EMI
Interference reduction techniques
Source, coupling path, & victim model
Estimating the amount of isolation required
Diagnosing an RF susceptibility problem

2. Current Routing & Least Impedance

Identifying the "centroid" of a current path
Understanding wiring inductance
DEMO: Path of least impedance
Controlling the current return path
How to use the LC = "a constant" concept
Electrically large & small structures

3. Interference Coupling Mechanisms

Review of the 4 coupling mechanisms
Key characteristics of each mechanism
Ways to recognize the dominant mechanism
Equivalent circuit for each mechanism

4. Field Containment, Bandwidth, Balance & Resonance

Routing to provide field containment
DEMO: Fields emitted by a coaxial cable
Relating bandwidth to transition time
CM currents and impedance imbalance
Resonances in lumped & distributed circuits
DEMO: Predicting & reducing resonances

5. Grounding for Safety and Noise Reduction

Signal routing is not the same as grounding
Characteristics of a ground structure
Safety grounding examples
Single point versus a ground grid
Avoiding kHz ground loops
Grounding analog and digital circuits
Grounding signals to chassis for RF & ESD immunity and to reduce RF emissions

Wednesday March 25

6. Interference Diagnostic Techniques

Diagnostic analysis & measurement tools
How to determine the dominant mechanism
The influence of circuit impedance
Diagnostic measurement techniques
Using current and E & H field probes

7. Filtering to Reduce Conducted Noise

Current blocking & diverting strategies
Types of filters
CM and DM filter techniques
GHz filtering techniques
Reducing capacitor mutual inductance
When to use ferrite beads

8. Field Containment Using Self Shielding

The low cost & wide bandwidth approach
Signal routing provides the containment
DEMO: Twisted pair versus coaxial cable
Misuses of twisted pair

9. Reducing Capacitively Coupled Noise

DEMO: Capacitive shielding example
Capacitive noise reduction options
DEMO: Shield connection for twisted pair

10. Reducing Inductively Coupled Noise

Reducing mutual inductance
Eddy current shielding
Magnetic flux shunting
DEMO: Magnetic shielding options

11. Electromagnetic Wave Shielding

Skin effect & RF containment
Making cable shields effective at GHz
Sizing air flow openings
Controlling CM currents
EM containment is more important than grounding

Upcoming Events

IEEE R5 Robotics Competition

Returning this April will be the annual IEEE robotics competition! For this event student teams will build robots within the competition rules and guidelines and can win the competition by having the smartest, fastest and most complete robot and use it to accrue the most points in the competition.

Venue:

The 2015 region 5 robotics competition will be held in the LaSalle ballroom at the Intercontinental hotel at 444 St. Charles Avenue in New Orleans, La, less than ½ mile from the historic French Quarter, on April 18th, 2015 starting at 8:00 AM. The venue will be available for robot practice starting on Friday April 17th at 2:00 PM. The venue is smaller than normal this year and we expect larger than normal participation so be prepared for congestion. Five practice fields will be installed starting at Noon on the 17th. These will be available when the venue opens. Teams will have access to the practice fields until 1 hour before the start of the competition on Saturday the 18th. Wireless communications with the robots is prohibited within the competition ballroom during both practice and competition.

Events and Prizes:

There are several events and meals scheduled starting Friday night. Registration is required for area entry and badges must be obtained at registration. The competition will conclude in the awards banquet on Saturday evening. Cash prizes and certificates will be awarded at the awards banquet to the top three teams. An additional "Perfect Score Prize" will be offered this year.

Specific details of award values will be provided by the IEEE at a later date.

For anyone interested in participation, the sign-up sheet as well as the complete list of rules and regulations may be found at <http://r5conferences.org/robotics-competition/>.



Upcoming Events

Technical Presentations on Transformers

Transformer Design and Design Parameters Transformer Manufacturing Processes

Friday, February 20th from 8am -12pm

Ameren Missouri

1901 Chouteau Avenue, St. Louis, MO

The St. Louis Power Engineering Society chapter of IEEE is providing technical presentation on Transformers at Ameren's headquarters (1901 Chouteau Ave) on Feb 20 from 8-12pm. PDH's will be provided. Registration details will follow. Interested individuals can contact an IEEE PES officer for additional information.

Part1: Transformer Design and Design Parameters

This presentation will be on the Basic of Transformer Design. The presentation will explain how a transformer designer interprets parameters such as MVA, lightning Impulse, Switching impulse, Percentage Impedance supplied by a customer. It will touch on Power rating [MVA], Core, Rated voltages, Insulation Coordination, Short-circuit Impedance, Short-circuit Forces, Loss evaluation, Temperature limits, Cooling, Sound Level, etc. It will also explain overload and life expectancy of a transformer as well when Delta winding is needed in Wye-Wye connection. The presentation will answer why in North America we like to regulate from low voltage side whereas in Europe regulates from high voltage side.

Part2: Transformer Manufacturing Processes

This presentation will be on the Industry wide manufacturing process to build a transformer in the shop floor. Processes will cover Core Construction, Insulation, Windings, Core and Coil, Processing, Tanking, Testing and Shipping. Some of the hold-points during the processes will be explained as well what a customer should look into while doing factory inspection. The presentation will also cover reconnection both in LV and HV, LTC Tap changer both in tank and separate tank, Lead works.

Upcoming Events

St. Louis Section IAS Chapter Meeting

Towards an Electrified Transportation Industry: Are we there yet?

Babak Fahimi, PhD

The Renewable Energy and Vehicular Technology Laboratory, University of Texas at Dallas

Monday, March 9, 2015, at Noon

104 Emerson Electric Co. Hall, Missouri S&T, Rolla

There are numerous rationales for electrification of transportation industry, yet the evolution of EVs/HEVs has portrayed a rather sluggish growth and many startup companies have failed to successfully pass the valley of death in this sector. This presentation is focused on fundamental implications of the electrification process in automotive industry. To this end a retrospective analysis of energy storage, electric motor and power electronic converters will be offered. A technical overview of the main contenders of today and near future for each category will be discussed. Compliment to a series of technical value propositions and discussions, a cost parity analysis with respect to conventional vehicles will be added to provide a more realistic outlook and to identify the most sensitive elements in this paradigm shift.



Dr. Babak Fahimi is a professor of electrical engineering and the founding director of the renewable energy and vehicular technology research center at the University of Texas at Dallas. His areas of interest include numerical modeling of electromechanical converters, design and control of power electronic circuits and energy management systems. . Dr. Fahimi has been the recipient of the Richard M. Bass young Power Electronics investigator award from the power electronics society of the IEEE, the young investigator award from the office of naval research, the Ralph Teetor award from the society of automotive engineers, and the Fulbright scholarship from the department of state. He is a fellow of IEEE for his contributions to” analysis and modeling of adjustable AC motor drives”. Dr. Fahimi has been the chairman of the IEEE Industrial electronics committee on power electronics and electric machinery.

Upcoming Events

IEEE MADC APPLICATION PROGRAMMING

IEEEmadC (Mobile Applications Development Contest) is a new international contest organized for all IEEE student members across the globe. The main goal of the IEEEmadC is to provide additional competitive activities for students in the scope of computer science. By competing, students will focus on developing their technical, social and team skills. IEEEmadC is organized in four main stages (Education, Idea, Development and Judging stage) within six months from November 2014 until April 2015. Teams of up to three students are invited to devise and develop mobile applications that could contribute to the IEEE community or apply technology for humanity.

The stages are as follows:

Education: while this stage has already past there is still time! Participate in workshops as well as lectures to learn skills to apply throughout the program!

Idea: Describe the app idea in under 150 words and wait for approval.

Development: Actually develop the application you created!

Judging: Find out if your application won!

Awards: There are cash and smartphone prizes!

Interested?

Well then simply go to <http://ieeemadc.org/> and see a complete list of all rules, regulations, and to sign up!



Advertisements

Volunteers Needed for the 2015 FIRST® Championship



**FIRST® changed my life.
Let it change yours.**

VOLUNTEER 2015 FIRST® Championship | April 22-25 | St. Louis, Missouri

**VOLUNTEER 2015
FIRST CHAMPIONSHIP**

 <http://www.usfirst.org/vims>
*FIRST® Championship Volunteers must be 16 or older.
WWW.USFIRST.ORG


FRC
FIRST® Robotics Competition

Advertisements

The Engineers' Club of St. Louis
wants

YOUR FIRM...

To sponsor a table for
CAREER NIGHT

For Graduating Seniors and Technical Students

Friday, February 6, 2015

3:00 P.M. to 6:00 P.M.

Cost:

\$75 / Table for E-Club Member

\$125 / Table for Non-members

Engineers' Club of St. Louis

4359 Lindell Boulevard

To Reserve a Table, Contact Kurt Krispin

(314) 533-9333 or kurt.krispin@engineersclub.net

Reserve your space early as this event has sold out in the past

SPACE IS LIMITED!!



To be notified when seminar registration is available, sign up [here](#).