Madison Section Newsletter

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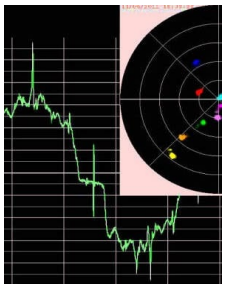
Upcoming Events

February Section Meeting: "Power Quality / Harmonic Distortion"



- Speakers: Eric Sonju/Duane Craig of Power Systems Engineering, Inc.
- Professional Meeting
- Date: Thursday, February 22nd at 5:00 PM
- Fee: Members $5, Guests $10, Students FREE
- Location:
  MG&E
  623 Railway Street
  Madison, WI 53703
- Pizza and a drink will be served
- Please Register at the IEEE-Madison event page.
- Non-member guests are always welcome.

Abstract: Power electronic devices are commonplace and increasing in number in commercial and industrial facilities as well as the grid. Power electronics provide electrical device control and modulation through voltage and frequency manipulation as well as many other functions. Utilities across the country are concerned about power quality as it effects them as well as their customers.
Power electronics are found in transformers, invertors, variable frequency drives, ballasts, drivers, power supplies, LED lamps, computers, programmable logic controllers and others. However, as power electronic devices multiply so does the occurrence and magnitude of harmonic distortion in the electrical distribution system. Excessive harmonic distortion can lead to unresponsive equipment, and electronic equipment damage. This talk will address power quality issues and harmonic distortion in facilities:

1. What is good and bad power quality?
2. Fundamentals of creating and avoiding power quality issues
3. What are harmonics?
4. How are power electronics associated with harmonics?
5. Consequences of harmonics
6. Harmonic distortion levels and thresholds
7. Mitigative and corrective measures

Biography: Eric Sonju, President -- Erik earned a BS degree in Electrical Engineering from North Dakota State University at Fargo, North Dakota with an emphasis in power systems. He has over 20 years of experience in the power industry, with the majority of those years providing professional engineering consulting services to electric utilities and private industry throughout the United States and Canada. His expertise includes engineering studies, design and business strategy matters in the electric power sector, including utility management, power delivery infrastructure, and technical applications. Erik is a licensed Professional Engineer in 20 states and in the Canadian province of Saskatchewan.

March Life Member Meeting: "Life Cycle Assessment for Electrical Engineers"

- Speaker: Andrea Hicks, UW-Madison Civil and Environmental Engineering
- Professional Meeting
- Date: Thursday,March 1st at 11:30 AM
- Fee: Members $5, Guests $10, Students FREE
- Location:
  Sequoya Branch Library
  4340 Tokay Blvd.
  Madison, WI 53711
- Pizza and a drink will be served
- Please Register at the IEEE-Madison event page.
- Non-member guests are always welcome.

Biography: Andrea Hicks specializes in using life cycle assessments and modeling to quantify environmental impacts of products and processes. Her work includes industrial ecology, or using basic ecological principles to better understand and design human products. For example, Hicks is thinking about ways to design a product where the waste could become the building blocks for another product or service. Her interests include agent-based modeling, the rebound effect, and environmental implications of technology.

March Section Meeting: "LED Lighting: Innovation in the Marketplace"

- Date: Thursday, March 15th, 2018
- Speaker: Ingrid McMasters, LC
- Details: Lecture and Tour of ETC, starting at 5:30PM
- Pizza and Beverages will be served. $5 Members, Students Free, Else $10
- Please Register at the IEEE Madison Section event page.

- Location:
  Electronic Theater Controls, Inc.
  3031 Pleasant View Rd.
  Middleton, Wisconsin 53562
- **NOTE:** This is an EVENING Meeting!

Talk: Ingrid McMasters will discuss the reasons why LED lighting is quickly becoming the most specified light source in the market and provide a reality check on the pros and cons of the technology. She will share some of the most common applications and identify some of the myths of LEDs. She will also touch on why LEDs can be difficult to specify and use when compared to traditional lighting technologies.

Tour: Following the talk we will have a tour of Electronic Theater Controls facility. ETC is a global leader in the manufacture of lighting and rigging technology for entertainment and architectural applications. Founded in Madison, Wisconsin, in 1975, ETC was a college project that grew into a major business, with Fred Foster as the current chief executive officer. ETC's international headquarters is located in Middleton, Wisconsin. The company also has offices in Mazomanie (Wisconsin), New York, Hollywood, Orlando, Hong Kong, Copenhagen, Ede (the Netherlands), Rome, London, Berlin, and Holzkirchen (Germany). ETC employs nearly 900 people around the globe.

Section News

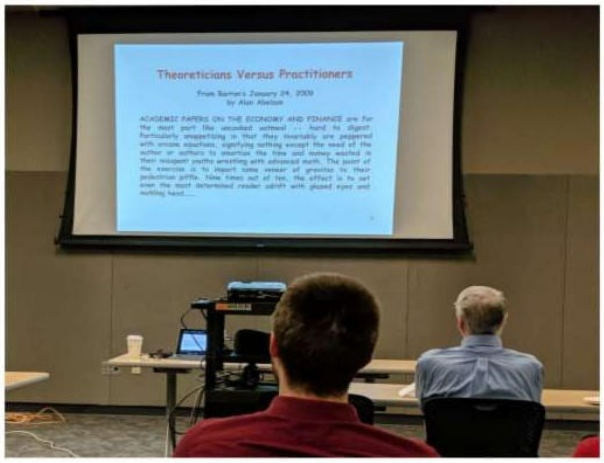
- **Meeting Reviews**

January, 2018 Life Member Affiliate Group Meeting (by CR Kime): At the January 3, 2018 IEEE Madison Life Member Affinity Group meeting, Professor B. Ross Barmish of the Department of Electrical and Computer Engineering, UW- Madison, presented an overview of his collaborative research via a presentation entitled "On Stock Trading Algorithm Research Based on Adaptive Feedback Control Loops."

In contrast to model-based technical analysis methods which use future stock price predictions from past stock price behavior, his model-free approach employs a feedback control to determine investment level. To motivate his work, Barmish presented conceptual arguments, as well as an example showing how price prediction methods can run amuck in the presence of volatility in the market. Reference was made to model-free approaches by others in the 1990s, with embellishments to address risk containment in 2000. An analogy between coin tossing and stock trading illustrated drawdown of assets as a critical problem, even in the face of a perfectly modelled coin. Beginning with a very elementary example, the coin-tossing problem was modeled by a simple feedback control loop. This simple framework was used to demonstrate that models with initial significant constraints on market behavior can be developed that permit the modeling of a stock transaction, incorporation of non-linearities and modeling for long or short trades. The culmination of this is his Simultaneous Long-Short (SLS) Controller.

Back-testing simulation results presented demonstrate the effectiveness of the SLS Controller on detailed daily price data with realistic practical considerations. For Apple stock, after the Crash of 2008-2009, a simulation using the SLS Controller demonstrated that it properly abandoned short investment in a rising market. Another simulation, again using the Apple pricing behavior, involved active trading by a day-trader. In this case, the assets were volatile but down-trending in spite of the rising closing prices. For this scenario the results indicated that day-trading can be problematic in terms of asset management. A final simulation was described for a very volatile time period for the Euro FXE currency. Using a Buy High – Short Low approach, beginning with a $10,000 initial investment, a gain of 35% over 1000 days with much less volatility than that present in the currency trading prices was accomplished.

The talk concluded with a brief description of five areas for future work followed by a great question and answer session.



February ECN Meeting (Review by Randall Iliff): On February 8th the IEEE-Madison ECN “Meet and Greet” took place at Sector 67. The group was small, (five in attendance), but resulted in a number of useful introductions and connections. Stefan, Jim and Randy were attending the group for the first time. Tom and Chuck shared the history of the group, events from last year and discussed upcoming topics including how the new tax law will impact those in consulting roles. Tom provided an overview of the mission of the group to connect talent with needs and invited input on how that might be accomplished. Suggestions included finding a more “business recognizable” location for some events. The thought was that Sector 67 is very entrepreneur friendly, but may not be seen by corporate innovation leaders as a place to find talented professionals. Suggestions included the MG&E Innovation Center, UW locations, and others. We also discussed how to reach the levels and roles in organizations that would represent good connections. Because the group was small, we also had time to engage in interesting conversations around current topics.

- ## Upcoming Meetings

  February Section Meeting: This meeting will be held at MG&E and features two experts in power quality and harmonic content issues. The talk is being held in the third floor conference room at MG&E -- please note that escorts are required from the main entrance.

  March Life Member Affiliate Group Meeting: The topic of this meeting concerns the life-cycle cost of devices. The speaker, Andrea Hicks, will use lighting to emphasize the life-cycle, environmental impact of product design and production.

  March Section Meeting: This will be a technical talk at ETC combined with a tour of the ETC facility. Ingrid McMasters will discuss the impact of LED lighting from the lighting design perspective, highlighted by current devices and enhanced by ETC lighting systems. Following the talk,tours for smaller groups will be given by ETC personnel. **STUDENTS:** a bus transporting you to the talk will leave the Madison Engineering Hall location at 4:50 -- Please indicate that you need a ride when registering.

Regular Meetings

- ### Section Meetings

  The third Thursday of January through May, and September through December is reserved for a meeting to provide recent research, developments, trends and/or innovations in one of our membership's technical areas.

- ### Life Member Affinity Group

  The first Thursday of January, March, May, September and November is reserved for a meeting on a topic selected from a broad range including such areas as technology, science, history, culture and leisure.

- ### IEEE-MSN-ECN Networking Meetings

  - Purpose: Presentations, Discussions, networking
  - Date: First Thursday of even-numbered months
  - Time: 11:45 AM to 1:00 PM

- Location: Sector67, 2100 Winnebago Street (East Side of Madison)
- Parking: Park in lot or on Winnebago Street.
- Process: Members are encouraged to make introductions, describe endeavors, and make request for: contacts in target companies, needs, resources.

Membership Upgrades

Those interested in upgrading their IEEE membership level should send their resumes or other information showing five years of significant performance in an IEEE-designated field to Charles J Gervasi via email at cj(at)cgervasi.com. Madison Section Board will attempt to find Senior IEEE members knowledgeable in the applicant's area of practice who may be able to provide references. You are invited to attend the informal networking portion of the monthly Section meetings (starting at 11:30am) to meet the Section Board members and discuss intentions.

About IEEE

The Institute of Electrical and Electronics Engineers or IEEE (read Eye-Triple-E) is an international non-profit, professional organization dedicated to advancing technology innovation and excellence for the betterment of humanity. IEEE and its members inspire a global community through IEEE's highly cited publications, conferences, technology standards, and professional and educational activities. It has the most members of any technical professional organization in the world, with more than 300,000 members in around 150 countries. The IEEE consists of 38 societies, organized around specialized technical fields, with more than 300 local organizations that hold regular meetings. Discover what IEEE Member Discounts can offer you. The Member Discounts portfolio consists of insurance products and programs for the home, office and travel, all at excellent group rates and reduced pricing. Visit IEEE Member Discounts to see what's available in your location and enjoy the savings. For more information, please visit:

IEEE.ORG.

Madison IEEE Section

The IEEE-Madison Section of the IEEE is a section in Region 4 of the IEEE-USA organized to serve IEEE members in the Madison, WI area with over 600 members. The 2017 Officers and Board Members are Tom Kaminski - Chair, Nate Toth - Vice Chair, Charles Gervasi - Treasurer, Steve Schultheis - Secretary, Nate Toth - Webmaster, Tom Kaminski - ECN Chair, Dennis Bahr - Engineering in Medicine and Biology Chapter Chair, Chuck Cowie - Life Member Affinity Group Chair, San Rotter - Life Member Affinity Group Vice Chair, Scott Olsen - Membership Development Chair, Members at Large: Clark Johnson, Craig Heilman, Dennis Bahr, Sandy Rotter.

Job Openings

Check out WIEES.com for electrical engineering jobs in Madison and the surrounding region. This site is maintained as a service for electrical engineers. Jobs are displayed starting with the most recent postings first. You can filter results by location and job type. If you are hiring an electrical engineer in our area, for full-time or contract work, you can post the job in the *Contact Us* section on the WIEES.com site.

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- **Contact Us**

  The IEEE-Madison Section has a number of volunteer positions open if you are interested in helping out. Please direct any questions or comments to Tom Kaminski (Newsletter Editor) via email to tjkaminski(at)ieee.org.

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