



IEEE

Madison Section Newsletter

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Upcoming Events

• December ECN Meeting: "Bring Your Hi-Tech Toys"

Entrepreneurs and
Consultants Network



- Entrepreneurs and Consultants Network Meeting
- Professional Meeting
- Date: Thursday, December 7th at 11:30 AM
- Fee: Free
- Location:
Sector67
[2100 Winnebago Street](#)
[Madison, WI](#)
- Snacks and Drinks are available at Sector67
- Please Register at the IEEE-Madison [event page](#).
- Non-member guests are always welcome.

Talk: The Holiday Season is just around the corner. What Hi-Tech consumer items have impressed you? Bring your favorite one and be prepared to discuss it's technical merits. Also, be prepared to give give a brief introduction to what you do ("Elevator Speech").

• December Section Meeting: "Election/Volunteer Appreciation Social Event"

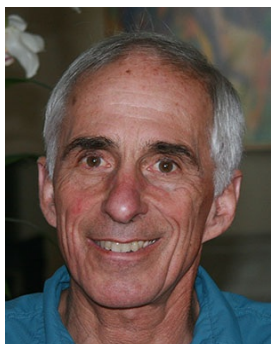


- Social/Election Meeting
- Date: Tuesday, December 19th at 6:00 PM until 8:00 PM
- Note: **Evening** Meeting on **Tuesday**
- Fee: Free Appetizers, Cash Bar
- Location:
Brasserie V
[1925 Monroe Street](#)
Madison, WI 53711
- Election of 2018 Officers (See Newsletter Below)
- Please Register at the IEEE-Madison [event page](#).
- Non-member guests are always welcome.

Event: The meeting will be a social event to honor the IEEE-[Madison](#) Volunteers who have helped make this past year for all IEEE Section members. It will be preceded by a short election for the

officers for 2018. The event will feature free appetizers with a cash bar available for all. Volunteers will also get free drinks. Plan to attend for a bit of fun and camaraderie and to thank the volunteers who help to make the section work for you. Bring a guest and have fun!

- **January LMAG Meeting: "On Stock Trading Algorithm Research .."**



- Talk: On Stock Trading Algorithm Research
 - Based on Adaptive Feedback Control Loops
 - Speaker: Professor B. Ross Barmish, UW-Madison ECE
 - Date: Wednesday, January 3rd at 11:30 AM to 1:00 PM
 - Fee: Meal Donation (Suggested): Members: \$5, Guests: \$10, Students: Free
- Location:
 - Sequoia Library
 - [4340 Tokay Blvd.](#)
 - Madison, WI53711
- Please Register at the IEEE-Madison [event page](#).
- Non-member guests are always welcome.

Talk: This talk will provide an overview of my research on the development of new stock-trading algorithms. The most salient feature of the work is that no model of any sort is used for the underlying stock-price dynamics. Instead, the size of the time-varying stock position is determined using some simple ideas involving the adaptive power of feedback control loops.

This approach is said to be "reactive" rather than predictive and amounts to assigning high priority to sound money management. Our emphasis in this talk will be more on the application than the theory. To this end, after explaining the key ideas driving this work, I will describe a number of software implementations which are used for back-testing simulations using historical data with attention paid to practical considerations such as transaction costs, leverage and margin.

Speaker: B. Ross Barmish is Professor of Electrical and Computer Engineering at the University of Wisconsin, [Madison](#). Prior to joining UW in 1984, he held faculty positions at Yale University and the University of Rochester. From 2001-2003, he served as Chair of the EECS Department at Case Western Reserve while holding the Nord endowed professorship. He received his Bachelor's degree in EE from McGill University and the M.S. and Ph.D. degrees, also in EE, from Cornell University. Throughout his career, he has served the IEEE Control Systems Society in many capacities and has been a consultant for a number of companies. Professor Barmish is the author of the textbook "New Tools for Robustness of Linear Systems" and is a Fellow of both the IEEE and IFAC for his contributions to robust control. He received two Best Journal Publication awards, each covering a three-year period, from the International Federation of Automatic Control and has given a number of keynotes and plenary lectures at major conferences. In 2013, he received the IEEE Control Systems Society Bode Prize. While his earlier work concentrated on robustness of dynamical systems, his current university research involves building a bridge between feedback control theory and trading in complex financial markets. In addition to this academic pursuit, in his capacity as CEO of Robust Trading Solutions, his work involves transition of stock-trading algorithms from theory to practice and government sponsored research on the NASDAQ Limit Order Book.

Section News

- **Section Elections**

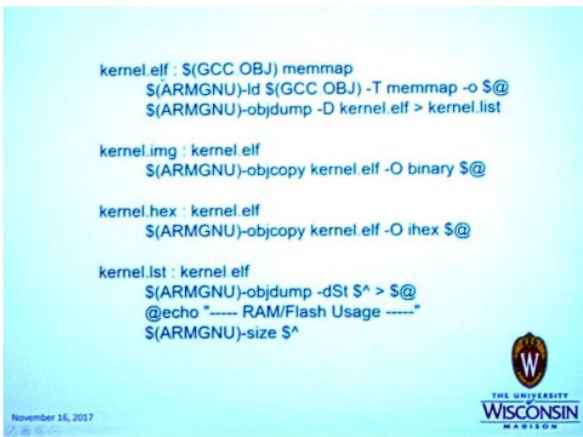
Vote in Person: IEEE Madison officers are up for re-election and because of problems with the email voting process, we are forced to have a vote at the last Section meeting of the year on Tuesday, December 19th. After the vote, the meeting will be open as a social event, honoring the volunteers who have worked for the semester. Please show up for the meeting and vote! Current slate of officers on the ballot (this will be opened for additional nominations prior to the vote) is: Chair: Tom Kaminski, Vice Chair: Nate Toth, Treasurer: Charles Gervasi, Secretary: Steve Schultheis, with Clark Johnson, Dennis Bahr, San Rotter, and Craig Heilman running for Member at Large.

- **Meeting Reviews**

November Life Member Affiliate Group Meeting: (Review by Charles Kime) The November LMAG Meeting featured a presentation, Back to the Future: Emulating Classic Audio with 21st Century Technology, by Steve Schultheis, the Secretary of the IEEE Madison Section, a musician, producer and audio engineer. A brief history of instruments including the piano, Hammond Organ and Moog synthesizer, served as an introduction illustrating mechanical, electromechanical, and electronic instruments. Today these instruments from the 20th Century have significant disadvantages for the purchaser compared to virtual music alternatives and in many cases are no longer manufactured as new products. Although audible perception of music by the listener is highly subjective, simply distinguishing between recordings of physical instruments compared to software emulations is impossible, even for many musicians. With this background, the remainder of the presentation covered the many steps of musical production from composition to distribution dealing with both 20th century traditional instruments and 21st century virtual instruments that use only hardware and software. Examples included a review of microphone technology and software emulations for different microphone types. Similarly, emulations provide the capability for virtual instruments such as the grand piano and the Hammond Organ. A major challenge for these latter virtual instruments is the potential for significant time delay, i.e. latency, arising from both hardware and software. Total delays can easily exceed 20ms, whereby it becomes impossible for humans to maintain synchronization with recordings and each other. One approach to dealing with latency is the use of two computers with a synchronizing clock sent from the first to the second computer. The mastering step for CDs is especially complicated because 24-bit master recordings must often be dithered and resampled, reducing audio quality. In contrast, streaming audio is not subject to these limitations, and offers the potential for increased audio quality over CDs as emerging standards are implemented. As a final highlight, Steve offered a brief piano performance to an enthusiastic audience using a very inexpensive virtual music technology to demonstrate high quality sound achievable at low cost. A printed copy of Steve's Presentation is available [here](#) and a short take of Steve playing is available [at Google Docs here](#).



November Joint EMB/UW-Madison Student Chapter: This was a joint UW-Madison IEEE Student Branch and IEEE-Madison Engineers in Medicine and Biology Chapter meeting. Dennis Bahr presented his up-to-date research on how to utilize the Raspberry Pi Zero, a "System on a Chip" selling for \$10 in single quantities as a "bare metal" system. Dennis explained a bit about the architecture of the system and how to utilize the Graphics and Floating Point processors without the benefit of an operating system. He then explained how to use the GNU cross-development tools to build an application in "C" and generate a downloadable image in "bin-hex" format. His goal is to use this powerful processor in a low-power, battery-operated blood pressure system with a useful time of about 10 hours between charges. He was able to give the audience good tips on building digital filters for real-time signal processing by using! Matlab to design the filters. Dennis also explained how to build a simple real-time operating system to support the digital signal processing applications required for the product. Dennis is willing to share the code he has developed with the students.



Upcoming Meetings

December ECN Meeting: This is an opportunity to pitch your consulting/entrepreneur skills while having fun discussing your favorite current technology. You might just get a few ideas for the upcoming "giving" season. Bring your own Brown Bag lunch and your elevator pitch.

December Section Meeting/Social Event: Please attend this event and vote for the officers that will represent the Madison Section for the next year. Vote first then socialize and enjoy appetizers on the Madison Section. Cash bar for general membership and guests. Note: **Tuesday Evening time.** Please do register so we can order the proper amount of food.

January Life Member Affiliate Group: Professor Barmish will be discussing how control theory can be used to manage stock portfolios. Kick off the new year with a bang and hopefully some insight on how to manage your investments.

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](mailto: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, Scott Olsen - 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 Kime - Life Member Affinity Group Chair, Charles Cowie - Life Member Affinity Group Vice Chair, David Jensen - Life Member Affinity Group Secretary, Members at Large: Clark Johnson, Craig Heilman, Dennis Bahr, Sandy Rotter.

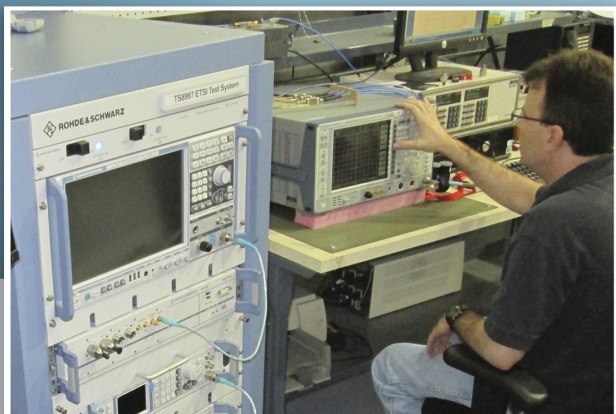
Job Openings

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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- **DLSEMC: Streamlined Wireless Testing**

Streamlined Wireless Testing



D.L.S. has invested in state-of-the-art technology that allows for streamlining traditional testing, which can effectively reduce your testing time and costs by up to 30%. D.L.S. is a Notified Body and is recognized by the FCC, EU, ISED, and other global organizations, including specializing in ETSI testing for compliance with the RED/R&TTE Directive. Let our 30+ years of experience in testing of transmitters and receivers ensure your product will meet compliance quickly and efficiently.

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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](mailto:tjkaminski(at)ieee.org)

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