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• Upcoming Events

◦ January Meeting: "Challenges & Solutions in IoT End-Point Security"



- Topic: Challenges & Solutions in IoT End-Point Security:
A Case for Implantable Medical IoT
- Joint IEEE-Student Branch/EMB18 Chapter Professional Meeting
- Date: Thursday, January 25th at 4:45 PM
- Dinner: Pizza and a Drink
- Fee: Members: \$5, Guests: \$5, Students Free
- Location:
Engineering Hall, Room: EH2535
1415 Engineering Drive
Madison, WI
- Please Register at the IEEE-Madison [event page](#).
- Non-member guests are always welcome.

Talk: Implantable medical IoT devices are used for monitoring, diagnosis, and therapy of an ever-increasing range of medical conditions, leading to improved quality of life and outcomes for patients. Advances in the use of implantable medical IoT devices have been accompanied, and in great part enabled, by increases in their functional complexity, wireless connectivity to allow for post-deployment monitoring, and programmability to allow therapy to be tuned to the evolving needs of each patient. These factors have also led to a rapid growth in concerns about security and reliability of implantable medical IoT devices, as underscored by recent trends in warnings and recalls of these devices due to failures, and a series of successful attacks on them demonstrated by academic researchers and the hacker community. The unique usage models of implantable medical IoT devices, and the need to provide very high levels of security and reliability under very stringent resource constraints, set them apart from other classes of computing platforms.

In this presentation, Dr. Kim will present the security and reliability challenges faced by designers of implantable medical IoT devices, and two techniques for improving the security and reliability are introduced. First, a zero-power contactless signal probing technique is introduced. Long-term signal monitoring for continuous physiological data collection on a device status monitoring for improved reliability is enabled by inductively coupled circuits with no active power consumption. Second, a vibration-based physically secure communication technique is presented. Mechanical vibration has a short transmission range and is highly perceptible, and thus it is suitable as an auxiliary channel for exchanging a cryptographic key to establish a secure wireless channel.

▪ February ECN Meeting: "2018 Kickoff Meet and Greet"

Entrepreneurs and
Consultants Network



- Entrepreneurs and Consultants Network Meeting
- Professional Meeting
- Date: Thursday, February 8th 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.



Event: Be prepared to give a brief introduction to what you do ("Elevator Speech"). This is your opportunity to discuss your company, or your consulting expertise.

• Section News

▪ Section Elections

2018 Officer Election Results: Chair: Tom Kaminski, Vice Chair: Nate Toth, Treasurer: Charles Gervasi, Secretary: Steve Schultheis, with Clark Johnson, Dennis Bahr, San Rotter, and Craig Heilman as Member at Large. Congratulations to the elected officers.

• Meeting Reviews

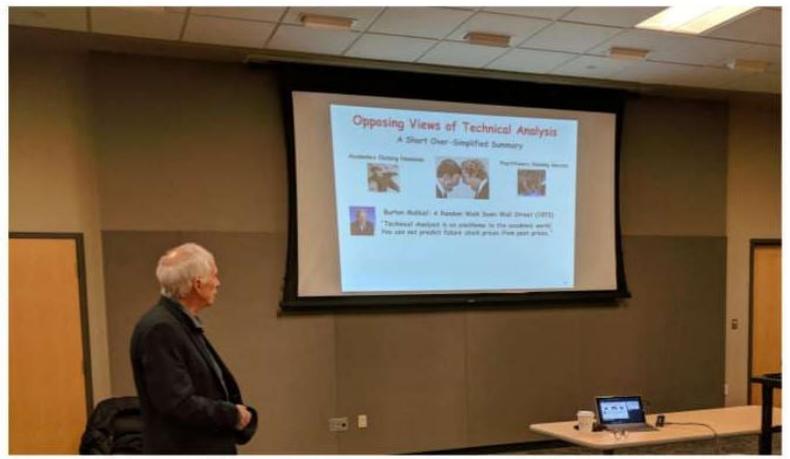
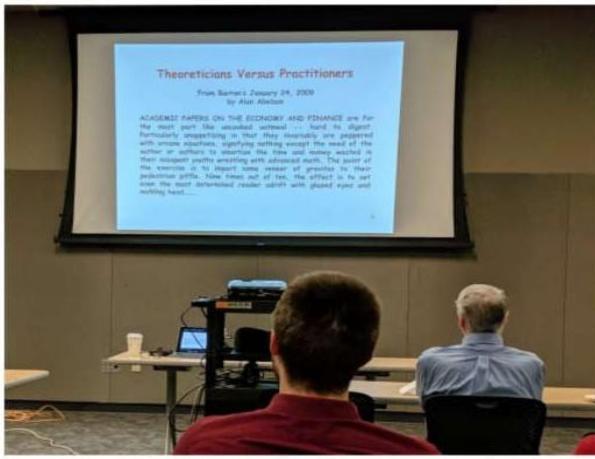
December ECN Meeting: Several people presented their interests and "tech toys" for the meeting. Jack Kissinger, a new member of IEEE (welcome, Jack!) showed a PIC-microcomputer based device that mimicked a cat's ability to follow a sound. The device used a pair of microphones and a fast ADC to correlate the direction of sound arrival and drive a servo to move the cat's head. Scott Olsen brought in an InfraRed camera and explained how he uses it to find wasted energy in facilities. He mentioned that the cameras used to cost many tens of thousands of dollars, but are now in the range of a consumer pocketbook as attachments to cell phones. Also shown was a weather sensor network complete with a 3D printed sensor housing that looked like a bird house, a Turtlebot 3 robot, and an add-on Matrix Creator Raspberry Pi hat.

December Social Event: Twenty-five people attended an evening meeting/election event at Brasserie V on Monroe Street. After a brief election, the evening turned to a social event, honoring the IEEE-Madison Volunteers. Many thanks to our volunteers. For 2017, they were Tom Kaminski - Chair/ECN Chair/Newsletter Editor, Scott Olsen - Vice Chair, Charles Gervasi - Treasurer, Steve Schultheis - Secretary, Nate Toth - Webmaster, 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.



IEEE-Madison December 2017 Election/Social Event

January, 2018 Life Member Affiliate Group Meeting: Professor Barmish gave an excellent presentation on his research into algorithmic stock trading and showed some of the results that he and his graduate students have attained. His primary interest is in applying control theory to stock trading using simple techniques based on the current value and past history of the stocks to be traded. First, he motivated his interest in not using predictive models, because models do not do well under extreme changes. Second, he used illustrative examples of historic stock data to see how different algorithms behaved. Using Apple, Inc. stock, he showed how day traders would have performed poorly using daily trades and not holding the stocks. The best strategy would have been to buy-and-hold the stocks for the period discussed. A simple control algorithm would have fared better, but not as well as the buy-and-hold for the period. Dr. Barmish also discussed some of the practical issues, such as where you get historic data and how you can manage to defer trading fees with a big enough investment. He encouraged everyone to try it and join in with his research group if you are interested.



• Upcoming Meetings

January Joint Meeting: Sorry about the short notice. The "Internet of Things (IoT)" presents a new opportunity for low-cost, flexible device connection. Please join us at UW-Madison Thursday, January 25th to hear about some of the security issues as Professor Kim from the Department of Electrical and Computer Engineering at the University of Wisconsin-Madison, tells us about the research at the Wisconsin Embedded Systems and Computing (WISEST) Lab.

Future Meetings: A February 22nd section meeting at MG&E at 5:00 PM on Power quality is planned. In late February or Early March, a talk on UAVs from the regulatory and perspective will be given by Chris Johnson. Chris is teaching a new course at the College of Engineering "Introduction to UAVs". A March 15th meeting at ETC on Lighting is in the works as well. The LMAG group is planning a talk by Andrea Hicks of the UW Energy Group on energy life cycle awareness and rebound effect. Sometime in May, a 2-hour seminar on Ethics (suitable for your Wisconsin PE License Renewal) will be held.

• 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, 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.

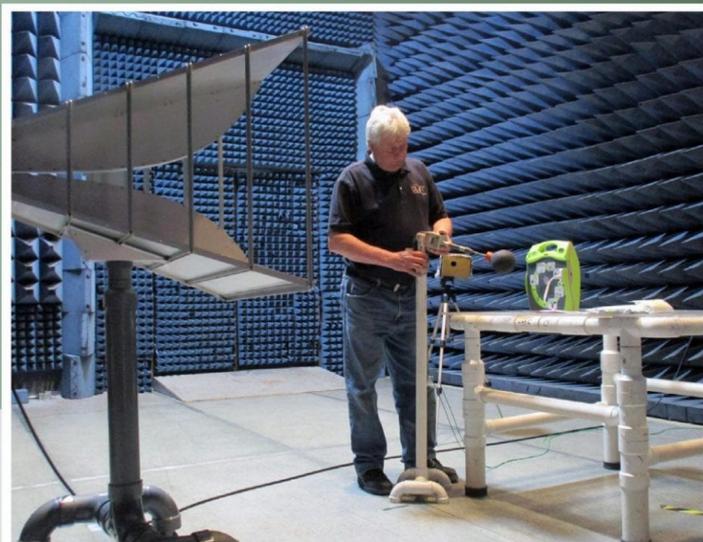
◦ Job Openings

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.

◦ Sponsored Content

DLSEMC: Streamlined Wireless Testing

Are you aware of the new medical device requirements?



The recently published 4th edition of the IEC 60601-1-2:2014 Standard has been recognized by the FDA and may now be used for electrical medical devices. This edition requires new emissions requirements, new test methods, and higher level/more stringent immunity tests for EMC compliance. These changes include new designated use environments, which are now split into three areas:

1. Professional Healthcare Facility Environment
2. Home Healthcare Environment
3. Special Environment



Schedule a transitional analysis to determine the current compliance requirements for your product

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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).

