

◦ Upcoming Events

▪ August ECN Meeting “Linux SoCs”



- Date: Thursday, August 6th, 2015
- Speaker: ♦ You! Tom Kaminski Moderator
- Location: ♦ Sector67, ♦♦♦♦♦ 2100 Winnebago Street ♦ (East Side of Madison)
- Time: 11:45 AM to 1:00 PM
- Bring your own lunch. ♦ Beverages and snack items are available to purchase at Sector67
- Please Register at the IEEE Madison Section [event page](#).

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This session is aimed at “System on a Chip” products like the BeagleBone Black and the RaspberryPi. ♦ These powerful single board computers running Linux are beginning to appear in products all over the world. ♦ Tom Kaminski will bring example systems and discuss tools and processes for developing applications that include hardware and software. ♦ Are you working with one of these SoCs? ♦ Bring it and your war stories for show and tell. ♦

▪ September Section Meeting “War Stories from the Cloud and 5Nines Tour”



- Wednesday September 16th, 2015, **11:30 AM** (Note Day and Time change!)
- Lecturer: Anton Kapella, 5Nines Vice President of Data Center and Network Services
- Location: Downtown Madison Public Library, Room 301
♦♦♦♦♦ 201 W Mifflin St
♦♦♦♦♦ Madison, WI 53703
- Pizza and Beverage will be available for Free for Registered Attendees
Non-member guests are always welcome.
- Please Register at the IEEE Madison Section [event page](#)

Talk:

Anton (Tony) Kapela will discuss the technical aspects of managing a data center and an extensive communications links from his unique perspective. ♦ Following the talk, there will be a tour of the 5Nines data center. ♦ Tony joined 5NINES in 2006 as an employee and was invited to become a member of the LLC in 2007. Tony provides expert level network design and architecture consultations to clients as well as manages 5NINES own wireless microwave network which covers most of Madison. ♦ In fact, this network is so solid, there has only been two brief outages in 5 years of uptime. Tony has been in the telecommunications and Internet routing field for over ten years. A frequent NANOG contributor and presenter, he’s been involved with developing unique solutions to difficult networking problems. He has also been a primary researcher in the BGP security field and is responsible for the architecture and operations of the 5NINES network. ♦

◦ Section News

▪ Summer Meeting Schedule

IEEE-Madison ECN: The only planned meeting this summer is the ECN Meeting in August. ♦ In that meeting, Tom Kaminski will lead a discussion on the “System on a Chip” devices like the RaspberryPi or the BeagleBoneBlack. ♦ These inexpensive devices are packed with resources and computing power and support various flavors of Linux. Increasingly often, these devices are being used to implement sophisticated products. ♦ Join in on the discussion if you have used one of these systems. ♦

IEEE-Madison On-Line Collabratec ♦ Community: Charles Gervasi petitioned for and created an On-Line Community for the Madison area. ♦♦ **Collabratec** ♦ is the IEEE’s latest innovation for members. ♦ It is an integrated online community where technology professionals can network, collaborate, and create – all in one central hub. The IEEE **Collabratec** ♦ online community offers a suite of productivity tools and is available to technology professionals around the world with exclusive features for IEEE members. Plus sign up is free to everyone. IEEE **Collabratec** ♦ can help you:

- Connect with global technology professionals by location, technical interests, or career pursuits
- Access research and collaborative authoring tools
- Establish a professional identity to showcase key accomplishments

One of the goals of **Collabratec** ♦ is to allow an interdisciplinary team to conduct private research. ♦ If you are not an IEEE member, you can sign up for **Collabratec** ♦ and join in many of the discussions, etc. ♦ You do not have access to all of the tools that IEEE Members have, but you can participate. ♦ Interested trying it out? ♦ You just need to log in with your IEEE account (typically your email address) and password and access **Collabratec** ♦ through this [link](#). Once you are logged in, join the Madison Community. ♦



▪ Review of June’s Events

ECN Meeting at Sector67: Chris Meyer gave a very informative presentation on rapid prototyping and showcased many of the available tools at Sector67 that can be used for the process. Chris used a simple circuit example (a 555 timer with LEDs that blink on an off) to demonstrate the process. All of the tools he demonstrated were Open-Source, starting with the KiCad schematic capture and layout tools. Chris then took us through preparing a CNC routing file generation process that produced the routing information to have a single-sided PC board routed on a CNC Mill. The final step was to drill holes in the PC board — Chris demonstrated a home-made PC drill that was quite accurate. Drilling accuracy was improved by having the CNC process start a small pilot hole. One of the neat aspects of Rapid Prototyping is to have the board layout dimension transferred to 3D design software for a case/box to house the device. Chris showed two ways to make a box: 3D printing (very slow) and laser cut “stackable” pieces. The laser cutting process was much faster. End result: A professional looking product prototype for concept evaluation.

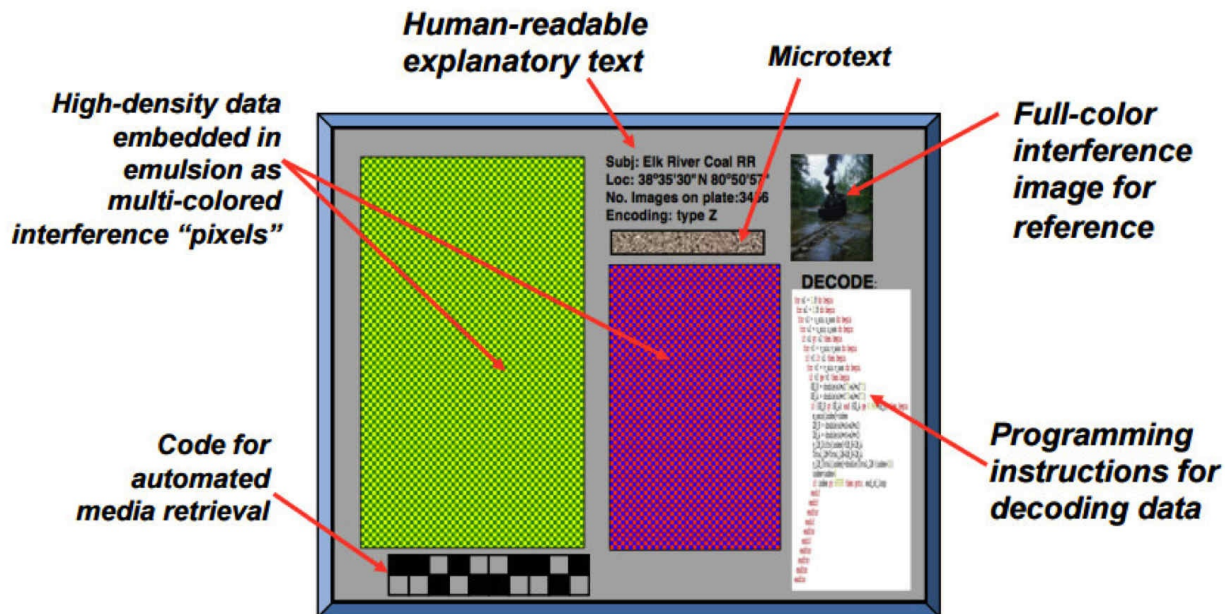


June IEEE-MSN Section Meeting: Our June Section meeting featured a talk by Madison Section Member-at-Large Clark Johnson on long-term data storage. People think of cloud data storage as forever, but modern data storage media are not that long-lived. Most of the data resides on disk drives that run and consume energy all the time. The amount of data being saved to remote services (i.e. the cloud) is staggering. Storage accounts for 6% of electricity use, and the rate of increase is 60%.

For true long-term storage, you should be able to put the media in a drawer at room temperature and leave it forever with out maintenance or energy. The reading and writing process should be simple enough that it doesn't require saving and maintaining the reading equipment. Johnson's storage system stores data using colors printed on gorilla glass, the thin, tough glass used in iPhones. There are 12 colors and 5 levels of amplitude, for an alphabet size of 60. The encoding is similar to I/Q QAM, except the axes are color and amplitude.

One possible WORF media format

(other possibilities include disks, wallet cards, memory sticks, etc.)



Ideally we would shine white light on the plates and receive monochromatic light. In practice, the system detects the light with an RGB sensor. The amplitudes of R, G, and B are different enough from color to color to provide a high SNR at the 60 symbol constellation diagram. One immediate use for this is a plate with the data from a mobile phone's BIOS or other critical files. A phone is capable of reading the slides with its camera. It can compare the data on the slide with the a critical file. A hacker may have changed a file in software, but the users can trust the slide did not get changed without their knowledge.



Upcoming Meetings

Life Member Affinity Group Meeting: There is no July meeting because of the conflict with July 4th. A September meeting is planned.
eLearning: No July event is planned. **ECN:** The August meeting has been announced above. If you are interested in learning about inexpensive "System on a Chip" boards, please attend. If you are a developer and would like to share your experiences with SoC's you are especially welcome. **IEEE-Madison Section:** The next Section Meeting will be in September with a talk by Tony Kapela of 5Nines at the Downtown Madison Public Library and a tour of 5Nines' data/communications center at 222 West Washington Ave. Pizza and Beverage are free, but remember to sign up.

Volunteers Needed

Micro Volunteers: Do you have some time to spare to help IEEE-Madison Section? Perhaps you have a meeting topic that you would like to see us host and could find a speaker. Maybe you have time to call a few members who might have forgotten to renew their membership.

Antennaa Modeler: Do you have experience with designing and modeling antennas? The UW-Madison IEEE Student Branch project team would love to have you help them model the RDF antennas they have built. Please consider sending some time helping with the Section activities. Let me know (tjkaminski (at) ieee.org).

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.

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.
- Contact: For assistance, call Tim Chapman 2 0 6 - 2 5 7 0

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

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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 2015 Officers and Board Members are Charles Gervasi - Chair, Steve Schultheis, Vice Chair, Tom Kaminski - Treasurer, Matthew Bartlett - Secretary, Timothy Chapman - Webmaster, Tom Kaminski - ECN Chair, Dennis Bahr - Engineering in Medicine and Biology Chapter Chair, Ann E. Thompson - Educational Activities Chair, Scott Olsen - Industrial Outreach Chair, Members at Large: Mitch Bradt, Clark Johnson, Craig Heilman, 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. Here is a sampling of the new job listings:

- Power Engineer in Madison
- Senior Electrical Design Engineer near Madison
- Solar Project Manager in Madison

◦ **Sponsored Content**

Soldering Courses: The Electrical Engineering Technology Department at Madison College is offering a J-STD-001 CIT and an A-610-CIT course this summer for soldering certification.

J-STD-001 CIT Trainer course

Certified IPC Trainer candidates who successfully complete the soldering workmanship portions of the course and the certification examination are given the instructional materials needed for training Application Specialists.



Please register at [this link](#).

A-610 CIT Trainer course

Certified IPC Trainer (CIT) training provides expanded information and materials to prepare individuals to deliver Certified IPC Application Specialist (CIS) training Application Specialists.



Please register at [this link](#).

◦ **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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Madison Section : <http://ieee-msn.truenym.net/>