

## 2013 SECTION OFFICERS

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Chapter IV Chair (Trident:Antennas, Microwave,  
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Chapter VI Chair (Geosciences & Remote Sensing)  
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Chapter X Chair (Technology Management Council)  
Chapter XI Chair (Medicine and Biology Engineering)  
Chapter XII Chair (Control Systems)  
Chapter XIII Chair (Education)  
Chapter XIV Chair (Robotics & Automation)  
Chapter XVI Chair (Computational Intelligence and  
Systems, Man and Cybernetics)  
Chapter XVII Chair (Nanotechnology Council)

# Fall Conference Section Conference and Dinner November 6, 2013



**Adoba Hotel**  
DEARBORN, MICHIGAN



Visit us online at <http://www.ieee-sem.org>



Southeastern  
Michigan

Electrical and Electronic Engineers Creating Our Future

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## WELCOME COMMITTEE

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Dr. Lubna Alazzavi  
Dr. Mariana Forrest  
Dr. Devinder Kaur  
Dr. Hafiz Malik

## EVENT SUPPORTERS

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**Additional Contributors / Supporters**  
Information not available by print deadline.

## FALL CONFERENCE ANNOUNCEMENT

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# Spring 2014

## Location to be Announced

## Keynote Address Topic To Be Announced

Web Site: [www.ieee-sem.org/spring](http://www.ieee-sem.org/spring)

To be updated as program  
information becomes available

## SPONSORSHIP

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How to finance our events is an issue our Southeastern Michigan Section faces each Spring and Fall. If your university, organization or corporation would be interested, please contact our Sponsorship Committee Chairman, Rajeev Verma at [rajeevverma@eaton.com](mailto:rajeevverma@eaton.com)

## EVENT SUPPORTERS

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## WELCOME

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Welcome to the IEEE Southeastern Michigan Section 2013 Fall Conference. This event is produced by the Southeastern Michigan Section with the intent to provide you with a number of IEEE related opportunities.

- Posters that will present cutting edge research activities being pursued in Southeastern Michigan
- Chapter speakers that will present consecutive brief overviews of their work in compelling subjects in the technical fields of interest of the related Chapter Societies. We are sure there is something for everyone in this eclectic mix of topics.
- Networking time to catch up with old friends, and make new acquaintances. Be sure to make that extra effort to introduce yourself to someone you have not met before. Everyone at the Conference is an 'expert' in something, and one of the most fascinating aspects of a Section wide conference is finding those interesting individuals you will meet 'for the first time'.
- Social time at Dinner with both old and new friends
- Once again, a very highly regarded Keynote Speaker
- Recognition of some of our Section volunteers who have contributed so much to our success in the last year.

Special thanks are due to the Conference Committee Officers and members who have volunteered countless hours to organize this event. This work involved developing the technical program, speaker arrangements, arranging for posters, venue arrangements, marketing the event, managing registrations and publication of the Conference booklet.

Please enjoy the Conference and the presentations. Please take advantage of the wealth of intellectual and network resources available here today. Thank you for your attendance and for supporting the IEEE Southeastern Michigan Section.

We are glad you came.

Imad Makki, PhD.  
SEM Section Chair

## CONFERENCE AGENDA

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5:00 PM - 6:30 PM	Registration Display Tables / Student Posters / Networking
6:00 PM - 6:30 PM	Poster Presentations and Poster Judging
6:30 PM - 7:30 PM	Technical Presentations (Sequential Presentations)
7:30 PM - 8:00 PM	Dinner
8:00 PM - 8:30 PM	<b>Keynote Address</b>
8:30 PM - 9:00 PM	Awards and Recognition
9:00 PM - 9:15 PM	Cultural Entertainment



### Cultural Entertainment Indian Classical Dance

**Vidyanjali Dancers**  
Bharatha Kala Shreshta  
Sudha Chandrasekhar

## KEYNOTE SPEAKER

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# The Future Starts Here....

## Rock Marcone

The future starts here with a new model for rapidly delivering solutions to our customers. General Dynamics Land Systems is a global leader in the design, development, production, and support of ground combat vehicles and has a strong foundation of providing solid and strong system engineering capabilities to our domestic and global customers across the military vehicle spectrum.

Now, General Dynamics is meeting the future needs of its customers through an innovative and collaborative process that leverages a full spectrum of engineering expertise and the resources of the Maneuver Collaboration Center (mc<sup>2</sup>).

mc<sup>2</sup> is General Dynamics "window on the world" and has created a sea change in the way Land Systems finds solutions for our customers. mc<sup>2</sup> uses a highly streamlined approach that includes an agile model for collaboration, as well as a state-of-the-art facility where ideas can be tested.

The collaboration center's highly charged and motivational environment inspires ideas from General Dynamics' employees, domestic and international customers, suppliers, academia and Warfighters. With a simple click of a mouse, a global community of knowledge can be tapped. This streamlined process is the key to spring boarding the rapid response that the modern battlefield demands.



## KEYNOTE SPEAKER

### Rock Marcone

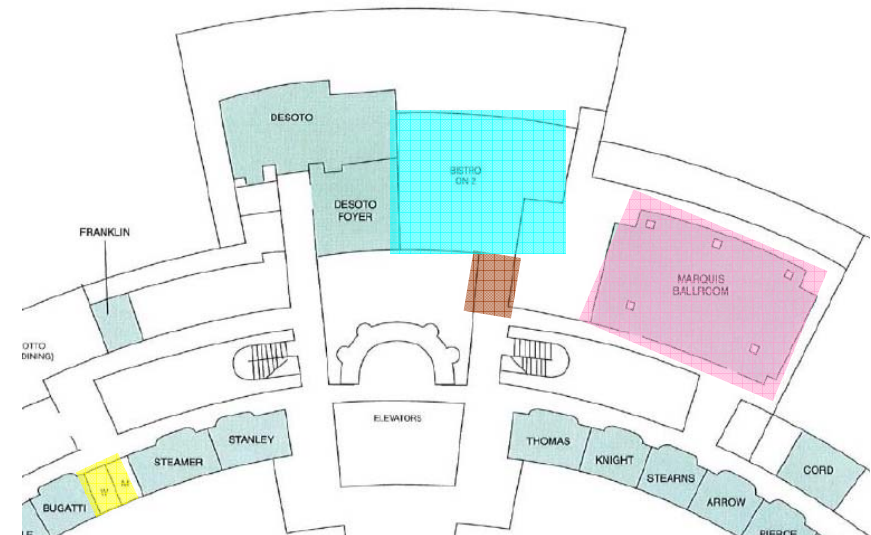
Director  
Maneuver Collaboration  
Center (mc<sup>2</sup>)  
General Dynamics  
Land Systems  
Lieutenant Colonel (Retired)



Rock Marcone was appointed Director of General Dynamics Land Systems Maneuver Collaboration Center (mc<sup>2</sup>) on June 4, 2012. Rock is the key advocate for the mc<sup>2</sup> community. In that role, Rock brings brilliant people together to find innovative solutions for GD customers through collaboration and innovation. Building on General Dynamics Land Systems' strong foundation of systems engineering and integration, the mission of the mc<sup>2</sup> is to create a collaborative environment to foster cutting-edge solutions and enable rapid transition of mature technologies into military vehicles and programs. Before joining GD, Rock served as the Commander of the Task Force 3-69 Armor for the Invasion of Iraq and was known as the "Tip of the Spear" in the 3rd Infantry Division advance to seize the Objective Peach the Bridge over the Euphrates and Saddam International Airport. Following command of his battalion, Rock served as the Senior Brigade Trainer at the National Training Center at Fort Irwin, CA. In that role, he prepared senior level Colonels for command in combat. His most recent positions include Vice President of Operations for APi Group, a 2 billion dollar privately held construction company and President of APi Federal Service Group. Rock holds a Bachelor of Science degree in General Engineering from the United States Military Academy at West Point and a Master of Science degree in Leadership and Organizational Design from Long Island University.

## FLOOR PLAN / MEETING ROOMS

### Adoba Hotel Second Floor



- Key:**
- Registration
  - Exhibits and Posters (Bistro Room)
  - Technical Presentations Dinner & Keynote (Marquis Ballroom)
  - Restrooms

## HONORED GUESTS

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**6:30 PM Recognitions**



### Master of Ceremony

**Matt Roush**

Editor  
WWJ Technology Report

Matt Roush joined WWJ Newsradio 950 to spearhead the launch of the Great Lakes IT Report which concentrates on Michigan-based companies and technologies. Prior to joining WWJ, Roush spent more than 10 years at Crain's Detroit Business. He has won numerous journalism awards from the Associated Press, UPI and the Association of Area Business Publications. Roush is a graduate of Albion College.



### Guest of Honor

**Dr. Virinder Moudgil**

President and CEO  
Lawrence Technological  
University

Dr. Moudgil is a graduate of the Harvard Institute for Educational Management, Banaras Hindu University (M.Sc., PhD) and Mayo Clinic (Post Doctorial). He was Senior Vice President for Academic Affairs & Provost at Oakland University prior to joining Lawrence Technological University. He has been a Visiting Scientist for the Boris Kidric Institute of Nuclear Sciences and the Univ. of Paris Sud, Bicetre, France. He has received many awards and recognitions. He has published 9 books, 110 papers/reviews and 122 abstracts.



### Special Recognition

**Risarg (Reggie) Huff**

NSO - Director Homeless Recovery  
Services and Adjunct Faculty Member  
Wayne State University  
School of Social Work

Risarg (Reggie) Huff is a licenced social worker practicing for more than 30 years. Reggie is recognized for his dedication to managing homelessness and to the goal of ending it.

## POSTER PRESENTATIONS (Bistro Room)

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**5:30 PM and 6:30 PM** Posters that highlight the cutting edge research activities being pursued in Southeastern Michigan

## DINNER

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### Dinner Menu

House Garden Salad  
with Ranch and Italian dressing

Spicy Chicken  
or Vegetarian  
Vegetable  
Potatoes

Strawberry Shortcake

## AWARDS

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**Recognition 2013 Senior Members**

**Recognition 2013 Fellows Members**

**Best Chapter Award**

**Speaker Appreciations**

**Special Recognitions**

Master Ceremony  
Guest of Honor  
Special Guest

**Best Chapter Awards**

**Poster Awards**

**Keynote Speaker Recognition**

**Event Supporters Recognition**

## Technical Presentations

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### Mind-controlled Robots and Prosthetics Using Non-invasive Electrodes



**Dr. Dean Aslam**

Professor  
Electrical and Computer Engineering  
Micro And Nano Techn. Lab (MANTL)  
Michigan State University  
Lansing, Michigan

The human body emits electromagnetic waves from brain, heart and muscles that can be measured by electroencephalogram (EEG), electrocardiogram (ECG) and electromyogram (EMG), respectively, that are all non-invasive. Recently, in contrast to conventional 28 EEG electrodes, single electrode inexpensive EEG devices have been marketed for mind-controlled games. Some of these devices are being explored to study ADD, ADHD, sleep disorders, Parkinson's, etc. This presentation will report the latest work on the use of non-invasive electrodes to detect EEG signals, related to the states of attention and meditation, and EMG signals to actuate robotic limbs and LEGO robots. This work also explores the use of EEG technologies developed at Michigan State University to study the neural disorders mentioned above.

Dr. Dean M. Aslam received his Ph.D. in EE in 1983 from Aachen Technical University (RWTH), Germany, and is currently Professor of Electrical and Computer Engineering at Michigan State University. He has published over 185 papers and holds 10 US patents in the field. Dr. Aslam was Assoc. Director of NSF ERC for WIMS (U of Michigan) during 2000 – 2010. He was a recipient of German DAAD Fellowship during 1975 - 83. Dr. Aslam is Associate VP Americas of MANCEF, a senior member of IEEE and founding Editor-in-Chief of Journal of Nanosystems and Technology (IJNST).

## Technical Presentations

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### 6:30 PM Sequential Presentations

Speaker presentations may be in a different order than shown here.

### Securing Personal Electronic Devices



**Dr. Atul Prakash**

Professor,  
Computer Science and Engineering  
University of Michigan  
Ann Arbor, Michigan

Our personal devices, such as personal computers and smartphones, are used to access a lot of sensitive information, e.g., financial sites, social networks, and data from device sensors. Unfortunately, securing these devices to detect and prevent information leakage against malicious software is a significant challenge. This presentation will discuss past and ongoing research on securing information on personal devices from malicious software.

Atul Prakash is a Professor in Computer Science and Engineering at the University of Michigan with research interests in computer security and privacy. He received a Bachelor of Technology in Electrical Engineering from Indian Institute of Technology Delhi, India in 1982 and a Ph.D. in Computer Science from the University of California, Berkeley in 1989. His research interests are in the areas of security and privacy. He has served as the Director of the Software Systems Lab in Computer Science and as an Associate Editor of IEEE Transactions on Dependable and Secure Computing.

## Technical Presentations

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### Changing Face of the Technology Professional



#### Jeff Beyer

Independent Consultant  
IEEE Consultants  
Affinity Group

In our on-demand world, it is important to have the right skills and expertise at the right time to drive technology and innovation. We recently formed the IEEE Consultants Affinity

Group to serve as the focal point for independent technology professions dedicated to helping clients solve business challenges.

Jeff is an independent consultant and Secretary of the newly-formed IEEE Consultants Affinity Group. He works with companies to develop new business technology. Recent projects include upgrading an air traffic control system and managing the development of a health care booking system. Jeff holds Bachelors and Masters Degrees in Electrical Engineering from Michigan Technological University.

### The Post-Recession Job Market



#### Dan Trudeau

Sr. Staffing Consultant  
The PRA Group, Inc.

The job market for engineers has changed significantly since 2009 and in ways no one expected. What's the new reality we're living in and what should an EE be thinking

heading into the future? This presentation will sketch out a street-level view of the modern EE career.

Dan Trudeau is a graduate of Western Michigan University and has been in the staffing business since 1998. He's worked that entire time with The PRA Group, where he's specialized in Electronic, Embedded, and Controls Development opportunities. He's worked across multiple industries including automotive, consumer products, industrial equipment, medical, aerospace, and others.

## Technical Presentations

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### Permutation Distance in Similarity Retrieval



#### Dr. Ishwar K. Sethi

Professor  
Computer Science & Engineering  
Oakland University

Similarity retrieval implies locating items in a large collection that are similar to a given item. As the size of the item collection grows, better methods are needed to keep the similarity search manageable. This presentation will look at the use of permutation distance in such settings including how the idea of permutation distance can be used to build image features for content-based image retrieval.

Ishwar K. Sethi is currently a professor in the Department of Computer Science and Engineering at Oakland University in Rochester, Michigan, where he served as the chair of the department from 1999 to 2010. From 1982 to 1999, he was with the Department of Computer Science at Wayne State University, Detroit, Michigan. Before that, he was a faculty member at Indian Institute of Technology, Kharagpur, India, where he received his Ph.D. degree in 1978. His current research interests are in data mining, pattern classification, multimedia information indexing and retrieval, and social media analysis. He has graduated over 20 doctoral students and has authored or coauthored over 150 journal and conference articles. He has served on the editorial boards of several prominent journals including IEEE Trans. Pattern Analysis and Machine Intelligence, and IEEE Multimedia. He was elected IEEE Fellow in 2001 for his contributions in artificial neural networks and statistical pattern recognition.



## Technical Presentations

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### Technology in the Age of Mindfulness



**Dr. Jasprit Singh**

Professor  
Electrical Engineering,  
Computer Science  
& Applied Physics  
University of Michigan

Advances in technology and global trade are ushering in an age where scarcity is shifting from resources and knowledge to “mindfulness”. This is reflected in the gap between resources, knowledge and action. This presentation will discuss the types of personal mentoring technologies needed to remove the knowledge action gap.

Dr. Jasprit Singh is a professor of Electrical Engineering and Computer Science and Applied Physics at the University of Michigan, Ann Arbor. Jasprit Singh (Ph. D Physics, University of Chicago, 1980) explores using semiconductors for technologies that form the basis of “The Knowledge Age.” His additional research interests blend technology and ideas from mindfulness practices to explore new designs and practices intended to answer the question, “How can the intersection of best lessons in technology and mindfulness reduce the gap between knowledge and action?”. Recently his work has focused on the use of smart phone based platforms to develop mentoring technologies for wellness.

## Technical Presentations

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### Non-Linear Manifold Learning



**Dr. William Grosky**

Department Chair  
Computer & Information Science  
University of Michigan, Dearborn

Dimensional reduction techniques, both linear and non-linear, play an important role in machine learning, and have many applications, including software engineering, pattern recognition, and content-based multimedia retrieval. These techniques improve the running time of many algorithms, and the algorithms many times produce better results. The presentation will discuss advances in the area of manifold learning, an area which relies on non-linear techniques, as well as the newer topological-based methods.

Dr. William I. Grosky is currently professor and chair of the Department of Computer and Information Science at the University of Michigan-Dearborn. Before joining UMD in 2001, he was professor and chair of the Department of Computer Science at Wayne State University, as well as an assistant professor of Information and Computer Science at the Georgia Institute of Technology in Atlanta. His current research interests are in multimedia information systems, text and image mining, and the semantic web. Grosky received his B.S. in mathematics from MIT in 1965, his M.S. in applied mathematics from Brown University in 1968, and his Ph.D. from Yale University in 1971. He has given many short courses in the area of database management for local industries and has been invited to lecture on multimedia information systems world-wide. Serving also on many database and multimedia conference program committees, he was an Editor-in-Chief of IEEE Multimedia, and is currently on the editorial boards of 20 journals.

## Technical Presentations

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### Embedded Sensors to Monitor Structural Armor Health



**Dr. Thomas Meitzler**

Senior Technical Scientist  
Electrified Armor Laboratory  
RDECOM TARDEC

Some of the current approaches to achieve structural health monitoring in armor using embedded sensors will be discussed. These methods include resonance vibration, guided waves and tomographic imaging using piezoelectric sensors. A sub-topic of discussion will be the research on spintronics for an embedded antenna technology in composite armor structures.

Dr. Thomas J. Meitzler received his B.S. and M.S. in Physics from Eastern Michigan University, completed graduate coursework at the Univ. of Michigan, and received a Ph.D. in Electrical Engineering from Wayne State University in Detroit. He has taught Physics, Astronomy and Engineering courses at The University of Michigan-Dearborn and Henry Ford Community College. From 1988 to present he has been a research scientist at the U.S. Army TACOM in the department of Survivability. Dr. Meitzler is currently developing and integrating technologies for embedded health monitoring, armor NDE and embedded signal detection. His research interests include infrared sensor characterization, non-destructive testing, nano electronics, and spintronics. Dr. Meitzler proposed a method for embedded armor health assessment that involves piezoelectric transducers and nanoelectronics and has built a laboratory around that idea.

## Technical Presentations

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### Networked Automotive Battery Management Systems (BMS)



**Dr. Le Yi Wang**

Professor  
Department of Electrical  
& Computer Engineering  
Wayne State University

Management of battery systems plays a pivotal role in electric vehicles, and in support of distributed renewable energy generation and smart grids. Reliable and efficient battery management, including charge/discharge strategies, diagnosis, control design, and large-scale networked used battery systems, demands new information processing and control methodologies. This presentation will describe recent advances in these aspects of BMS.

Dr. Le Yi Wang received the Ph.D. degree in electrical engineering from McGill University, Montreal, Canada, in 1990. Since 1990, he has been with Wayne State University, Detroit, Michigan, where he is currently a Professor in the Department of Electrical and Computer Engineering. His research interests are in the areas of complexity and information, system identification, robust control, H-infinity optimization, time-varying systems, adaptive systems, hybrid and nonlinear systems, information processing and learning, as well as medical, automotive, communications, power systems, and computer applications of control methodologies. He was a keynote speaker in several international conferences. He was an Associate Editor of the IEEE Transactions on Automatic Control and several other journals, and currently is an Associate Editor of the Journal of System Sciences and Complexity and Journal of Control Theory and Applications. He is a Fellow of IEEE.