



New York Monitor

Advancing Technology for Humanity

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A SMC presentation: "Immersive Technology" by Dr. George Chang: A group photo



Dr Frank Hsu (NY), Dr Amruthur Narasimhan (NJ Coast), Dr Amitava Dutta-Roy (NY) and Benjamin Chung (NY), all members of the IEEE at the "Cyber Security and Ethics" meeting, German Center for Research and Innovation (GCRI), New York



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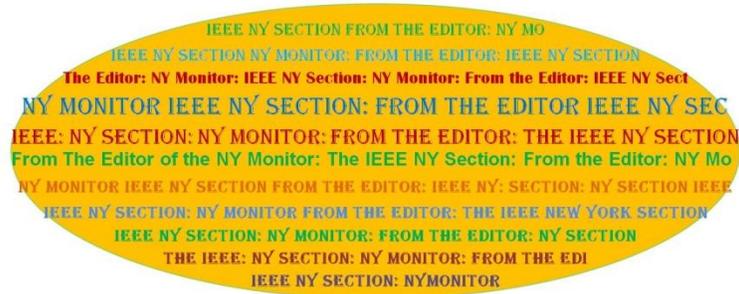
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THE EDITOR WRITES



JUST

the other day we were complaining of the snow and now some of us, already overwhelmed by the heat, are voicing dissatisfaction with the weather. However, seasons will come and go in cyclic order unless a cataclysm happens due to the global warming though that seems to be unlikely during the next few years. However, what will not come back are the opportunities each of us has to improve the quality of life on this planet. The IEEE gives us the means to refresh our knowledge of technology by listening to experts invited to many of our monthly presentations. On the same beat, you can share *your* knowledge by speaking at a meeting. You will be most welcome; *share* is the word we should use more often. Please write to us about your field of expertise and that you would like to make a presentation, and we will put you in touch with the right person who can organize such a meeting. At all meetings of the IEEE Section chapters (and by our sister organizations) there is always a time for networking with other engineers working in your field and who most likely live in New York City or its vicinity. The IEEE also offers many opportunities for mentoring younger engineers or still younger school students whose aspirations are to be a scientist, technologist, engineer or mathematician (STEM).



The IEEE, as a widely known organization, can open the doors of the security-conscious schools or colleges that as an individual you may not be able to do. We urgently need more engineers and you can give a hand to the young folks to energize their minds. We all will say “thank you.”

I have always requested all our readers to keep us informed about any paper they might have published, any book they have written, and any conference they might have participated. We would be happy to publish a synopsis of those papers and publicize the books. Do not take it for granted that everybody has seen your paper or book. We will give that ‘oomph’ to promote your contributions to technology. The information on NY Monitor is sent to 4,000 plus members of the NY Section and, I understand that many external readers browse the Monitor. Do you want to write a short easily understood (by our heterogeneous readership) article on your work? No problem; we will review, edit and publish it. Many of us actually make original contributions to technology. Dissemination of news about such contributions is an equally important offering. Let us do that for you. As long as Google and other search engines stay in business you will be known to the posterity through your writings and not by your material assets. (Google regularly scans the

NY Monitor.) The English novelist and playwright Edward Bulwer-Lytton in 1839 in a play wrote that “the pen is mightier than the sword!”

In this edition you will also notice that three well established companies have decided to advertise in our NY Monitor. We thank them for their decision. You can help us to sustain the activities of the New York Section by advertising in the Monitor. Those advertisements could be on behalf of your company or, if you are a consultant, you could just purchase a small space to post your business card. We will thank you just the same!

Following our past practice this posting will also contain “reports” on the technology-related events that were held during this month. The only exception will be a revisit to the letter of confirmation of the participation of New York Section in the Tri-County Science Fair held in April. We have posted the entire letter for all of you to see.

On 7 May we were present at the MeetUp NYC IoT group meeting where three industry representatives—Atmel, ARM and Stream Technologies—spoke. (Incidentally, MeetUp NYC IoT

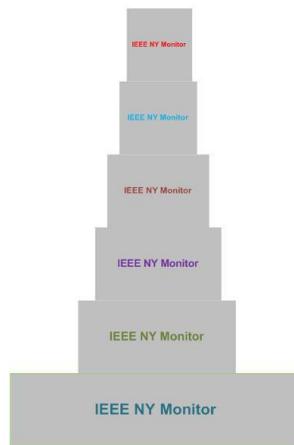
is supported by the IEEE Standards Association). Each of them presented his company’s plans with regard to IoT. Gartner figures on the growth of IoT during the next five years are staggering and exciting.

On the next evening we attended a presentation on Immersive Technology offered by the SMC chapter. Dr. George Chang, Dean, College of Natural, Applied and Health Sciences, Kean University, NJ. Dr Chang spoke on the technologies that are being developed to bring world world of some semblance of reality. To an engineer these technologies are exciting.

The last presentation we attended was on Cyber Security and Ethics at the German Center for Research and Innovation. We heard the views from both sides of the Atlantic on technological, legal and constitutional implications of privacy and security. There are many differences between those.

In this edition of the NY Monitor we have created a new section that gives the news of the technological contributions—including publications—recently made by the members of the NY Section.

We conclude this posting with our traditional Events at a Glance followed by our advertisement rates.



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EVERYTHING
MATTERS

In this Section

we report on the meetings of technological nature that we have attended in York City and in its vicinity during the month May. You may understand that it is just humanly impossible for a Monitor editor to be present in all meetings, even those organized by the NY Section chapters. We urge the chapter chairs to send us reports on their meetings (together with photos) to us as soon as they are over. We would

certainly like to keep the Section members informed about all our activities. That is one of the important purposes for which we should be proud of.

The first item in this section is the posting of a letter confirming the participation and support of the New York Section in the Tri-County Science Fair. This letter was inadvertently left out earlier.

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EVENTS ATTENDED

MeetUp NYC IoT

Our readers are perhaps aware of the existence of MeetUp groups in New York City and, in fact, all around the world. Such groups sprout from informal and *ad hoc* amalgams of a few like-minded people—entrepreneurs, tinkerers, lawyers, accountants, PR folks, investors, friends—who are interested in a common theme that could be technical, literary, artistic, musical, philosophical, or political in nature. Slowly the groups gather steam and draw more adherents and become loud voices. This process is only possible through the use of the Internet!

By now many of readers may also be familiar with the abbreviation “IoT” that means Internet of Things. The technology and applications of IoT are spreading fast. The IEEE has sponsored an international conference on IoT in Seoul, South Korea and various other meetings in various parts the world. Here Mr Mitchell Golner started the New York’s MeetUp NYC IoT group. I had the privilege of attending its first meeting in 2014. Since then the activities of the NY group have been supported by the IEEE Standards Association and the Internet Society’s NY chapter. The Internet Society or ISOC sustains the Internet Engineering Task Force (IETF) that overlooks the standardization processes adopted by the Internet community, communications networks and the Internet Service Providers (ISPs). It is refreshing to hear young entrepreneurs tell about their technical and business plans, and the need for investment in their fledgling companies. At those meetings job seekers can talk to potential employers, one-to-one, all dressed informally, eating a pizza slice or sipping

a glass of wine or a soda, whatever is available. I encourage all members of the NY Section to attend the MeetUp meetings. Golner can be reached by e-mail through his address: Mitchell@iotcentral.co.

On 7 May last the IoT group called for a meeting that was sponsored by Atmel, ARM and Streaming Technologies. All three companies are in the business of developing products for IoT. Atmel is a vendor of controllers. It is an Italian company and specializes in developing microcontrollers that use *open-source*



hardware based on the Arduino concept. ARM is a UK-based company, represented at the meeting by Jim Edson, that has been in controller and networking business for quite some time. Streaming Technologies, represented by Nigel Chadwick, is also a UK-based

company heavily involved with IoT.

At that meeting I learned that BBC has a joint project with ARM to give away microcontroller to schools for the young students to learn how to connect and hardware and how to write programs for ARM controllers. I am in touch with ARM to get more information on this project. Whenever I get it I will give you the information. In the meantime you can see below some of the photos I took at the meeting. You can also see the entire proceedings by logging into <https://www.youtube.com/watch?v=u9oYkXqRaks&feature=youtu.be>. The video was taken by Mr Joly MacFie, vice president of administration, ISOC, NY. We thank MacFie for letting us publish the link to his video.



MeetUpNYC IoT



NYC IoT Meetup: Participation

- Major disciplines for creating IoT products & services represented
- Members from early stage startups to corporate

Fields	Participants
<ul style="list-style-type: none"> Software Developers Electrical Engineers User Interface User Experience Graphic Designers Mobile Developers Industrial Designers Business People Investors 	<ul style="list-style-type: none"> Entrepreneurs SMBs Corporates Service Providers Angels VCs

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BBC Microbit and ARM

BBC will grant programs to IoT devices to school children in the UK intended to create a new wave of innovators.

Key partners involved - Microsoft providing the main programming environment using the latest complete service.

Device Features:

- ARM Cortex-M0
- 512KB on-chip memory
- USB programming

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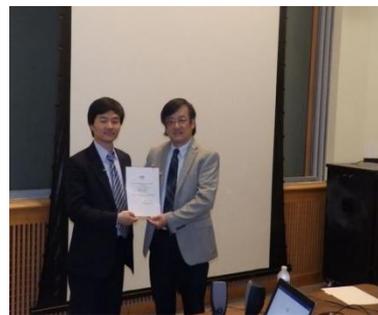
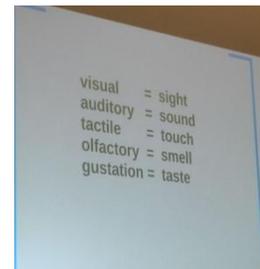
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SYSTEMS, MAN AND CYBERNETICS SOCIETY NEW YORK CHAPTER: IMMERSIVE TECHNOLOGY

The SMC chapter is one of the most active in the New York Section of the IEEE. The chapter invited Dr George Chang, Dean of the College of Natural, Applied and Health Sciences, Kean University, NJ, who specializes in immersive technologies to give a talk on the subject on 8 May 2015 at the Long Island University, Brooklyn, NY Campus. Chang, member of ACM (a sister organization of the IEEE) began his talk by a thorough explanation of the four senses, namely, visual, auditory, tactile, olfactory, and the sense of gestation. Dr Chang has built up a well-equipped laboratory at Kean where he and his students can perform experiments with virtual reality, the ultimate product of immersive technology. Though the simple virtual reality generators found in video games are relatively inexpensive, the upper end of the price tags can be high. His laboratory now possesses the state-of-the-art hardware that costs somewhere near \$600,000. One particularly

expensive but most sophisticated simulator of virtual reality is CAVE, short for CAVE Automatic Virtual Environment developed by Mechdyne Corporation of Chicago. The Kean labs will soon install CAVE 2. Dr. Chang very kindly has sent the link to PowerPoint presentation to his talk. You can access that at: http://prezi.com/b4-tyjhaagcq/?utm_campaign=share&utm_medium=copy&rc=ex0share. We thank Dr Chang for sharing his slides with us. The student and graduate members of the SMC were busy in taking photographs at the meeting. Those photos are accessible at <https://goo.gl/1OAsaO>. The Monitor thanks the photographers for taking those pictures. Mr Joly MacFie of ISOC NY also videotaped the meeting. That video is available at: <https://goo.gl/INfKFu>. We thank Mr. Joly MacFie for filming, editing it, and then posting the video on YouTube. With all these links under your control, you can easily simulate the meeting at your computer or smart phone. Then I do not have to write more. Do I?



CYBER SECURITY AND ETHICS

We as engineers usually get involved with the technical part of cyber safety: security codes, encryption and decryption strings, captcha and other similar staples. Technology of security by means of hardware is also developing fast. However, the legal and ethical issues of cyber crimes are conspicuously absent from our in-depth technical discussions. But behind the pure technical challenges there is a vast extent of expertise on legal, constitutional, and ethical issues concerning cyber security. In many instances the matters are interleaved. The German Center of Research and Innovation (GCRI) in New York did a splendid job by inviting some leading technical and legal experts on cyber security from both sides of the Atlantic for a panel discussion that took place at the Center's premises on 21 May.

Prof Stephanie Schierdermair was the first to speak. She talked about an apparent parallelism between cyber attacks and criminal activities in sea. Schierdermair is a strong advocate of international law of the seas to be applied to cross-border breach of cyber security. The concept is interesting. However, in territorial waters it is not that difficult to define any area claimed to be inside the national borders of a nation. We have satellite imagery to help us in this problem. Internet is pervasive everywhere and the criminals can *jump* over some nations to attack another.

Next, Prof Günter Müller expounded some of his ideas. He has experience of technologies and their implications on our lives, since for many years he worked as a consultant to IT industry. He is in favor of more open Internet secured by technology.

Prof Russell Miller has experience of both US and German legal system, especially in constitutional laws of both countries. Miller drew the attention of the audience to the legal difference between *security* and *privacy*. He also pointed out the difference in the constitution of this country and Germany when

applied to cyber security. If we were to combat the cyber hazards it will be necessary to know the differences in not only between the laws guaranteeing privacy and security of citizens, business and the governments in these two countries but in the rest of the world as well. Cyber crime does not respect any boundary.

Panelists

Prof Russell Miller: Prof of Law at the Washington & LEE University School of Law in Virginia

Prof Günter Müller: Prof at the Albert-Ludwigs-Universität Freiburg in Germany

Prof Stephanie Schierdermair: Chair, European Law, International Law and Public Law at Universität Leipzig, Germany

Moderator

Prof Steven M Bellovin: Percy K and Vidal L W Hudson Professor of

As a moderator Prof Steven M Bellovin was excellent. I was amazed by the depth of his scholarship about the severity of the cyber attacks and the urgency with which it should be dealt with. Bellovin has been active in the technical and policy sectors of the Internet. He is a member of the Internet Engineering Task Force (IETF) and has taken part in various public and governmental committees on security and privacy. Thus, he is cognizant of the technical, societal and legal issues. He kept the panelists on their toes with pointed questions and getting himself involved in most of the questions and answers.

The session ended with a customary reception with opportunities for one-to-one conversation and networking. NY Monitor thanks the GCRI for inviting the IEEE members to its panel discussion. Thanks are also due to Ms Nathalie Schueller for sharing the photos posted here.

Photos of the discussion meeting are available from shortened URL: <http://goo.gl/PhelAv>

A video of the entire session can also be had from: <http://goo.gl/OMS6bn>

Podcasts of this and other sessions held at GCRI maybe accessed through: <http://goo.gl/m6SoKn>

The general URL of the GCRI Web site is: <http://www.germaninnovation.org>



Peter-Andre Alt, Denise Feldner, panelists Prof Günter Müller, Prof Stephanie Schiedermaier, Prof Russell Miller, Dr. Joann Halpern (Director of GCRI), and moderator Prof Steven M Bellovin



IEEE members: Dr Frank Hsu (NY), Dr Amruthur Narasimhan (NJ Coast), Dr Amitava Dutta-Roy (NY) and Benjamin Chung (NY)



The topic is interesting, right?



Security issues raise many questions



German beer stimulates conversation between an ACM Fellow and an IEEE Fellow



With this edition of the NY Monitor we introduce a new section in which we will post information on books and papers (both print and online) published by our peers in the NY Section on topics that advance technology. We are pretty good in organizing meetings and invite speakers to share their expertise with us. The new section on publications will draw the attention of the general heterogeneous membership of the NY Section, our friends and supporters to the fact that many of the

Section members themselves also perform research in or write about some specific areas of cutting-edge technologies. If you are a member of the NY Section and done any research work, recently written a book or a paper in a publicly available online or print publication please send it to the editor. Though for reasons of not violating copyrights we may not be able to publish the entire book or paper, we will certainly be proud of posting online a synopsis of your work. Read on...



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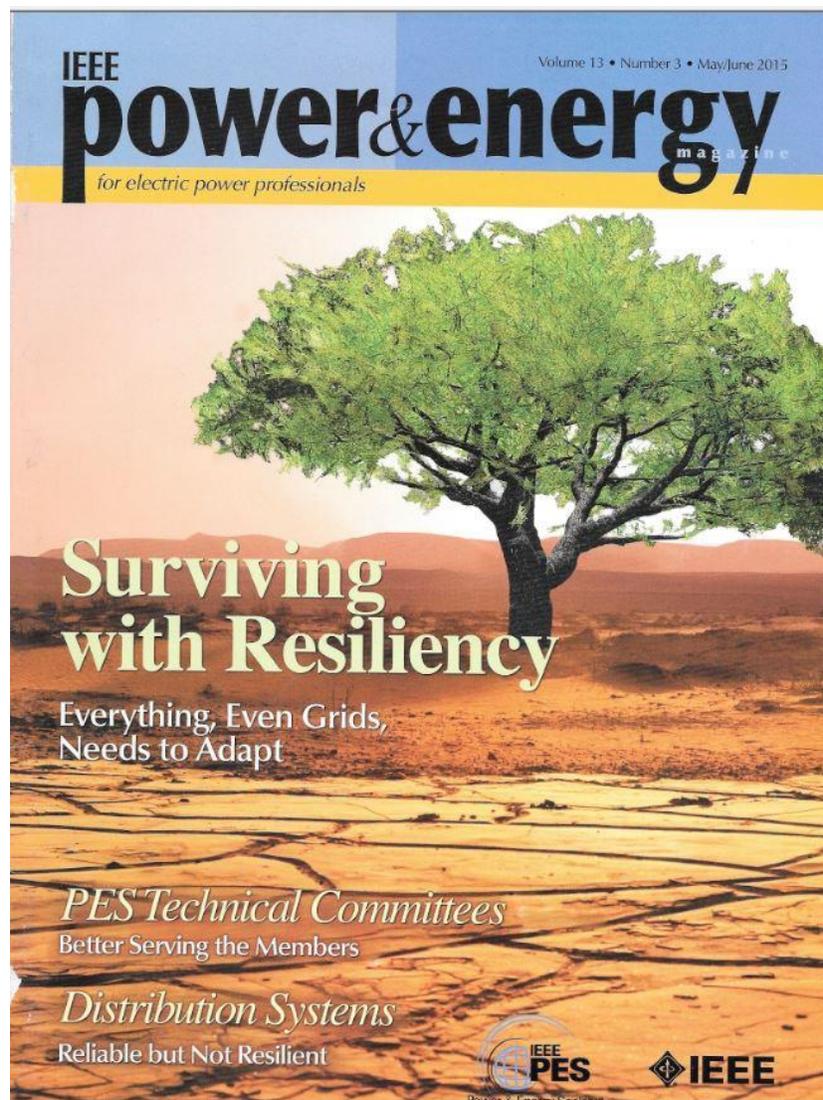
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Mr. Mel Olken, Life Fellow of the IEEE and a respected former Historian of the NY Section has been the editor-in-chief of the P&E Magazine since January, 2003. We congratulate Olken for his dedication to the IEEE and thank him for keeping

our members informed about cutting-edge technology in the field of power engineering. The P&E print magazine is available on line only to the members of the P&E Society.



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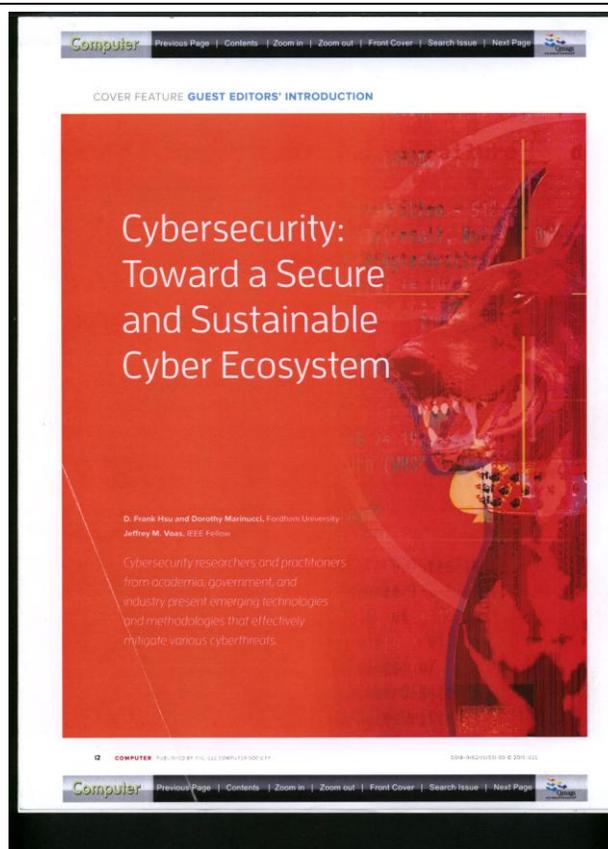
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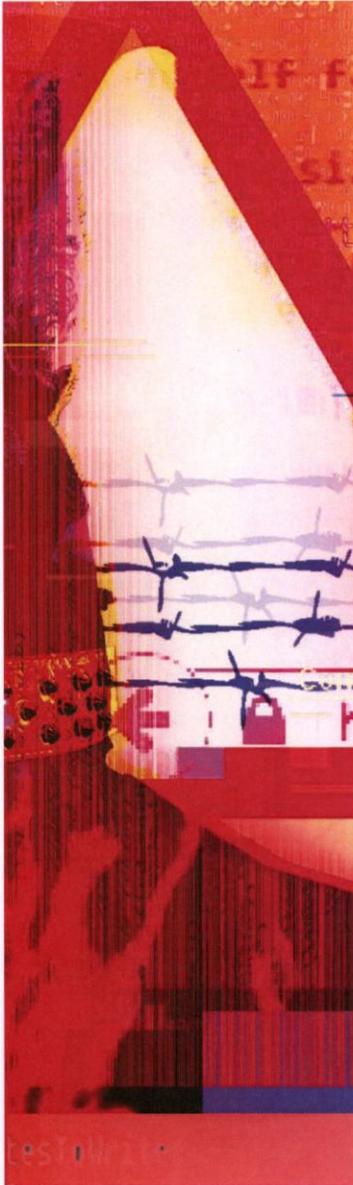


IEEE COMPUTER

COMPUTATIONAL INTELLIGENCE SOCIETY

Amid so much of hacking, and falsifications and misuse of our personal identities, we all are looking for the protective high walls of computer security. Dr Frank Hsu, a member of the IEEE NY Section and affiliated with Fordham University, New York seeks ways to avoid those cyber hazards. He is one of the organizers of the International Conference on Cyber Security held annually at Fordham. Dr. Hsu, Ms Dorothy Marinucci of Fordham, and Dr Jeffrey M Voas, Fellow of the IEEE were invited to be the guest editors of a special issue on cyber security of the of Computer, a publication of the IEEE Computer Society. To whet your appetite for reading current computer security topics, we are happy to provide you with the images of some pages of that special issue published in April 2015. (The last page also gives a glimpse into authors' respective backgrounds.) Selected articles and columns on computer security are also available online for free from <http://Computing Now.computer.org>. Dr Hsu is the current chair of the Computational Intelligence Society's NY chapter.





The advent of innovative networking, information, and communication technologies has given rise to a world of densely instrumented, closely interconnected cyber-physical-social (CPS) systems. In this highly complex CPS ecosystem, where those who consume data also generate it, everyone is a stakeholder.

CPS systems offer substantial benefits at the personal, organizational, and national levels. At the individual level, they enable us to lead richer lives in the way we learn about the world, as well as in our communications with one another. At the organizational level, they improve efficiency and productivity across industry, government, and academia. CPS systems drive various business operations including enterprise management, transaction processing, customer relations, supply-chain management, and marketing. Governments likewise use CPS systems to provide services to citizens and to improve interagency coordination. Such systems are also essential tools for educators, students, and researchers to discover and share knowledge. At the national level, CPS systems constitute the backbone of an economy and its security.

Such benefits carry risks. The same technologies that make the CPS ecosystem possible are also used by hackers and other malicious actors to commit cybercrimes ranging from fraud to data and identity theft to distributed denial-of-service and other types of attacks on private and public institutions.

Historically, computer engineering has focused on improving performance, reliability, and affordability, but not security. However, as cybercrime has become increasingly costly

and destructive, as demonstrated by recent attacks against major retailers, banks, and corporations, cybersecurity has become a critical issue for all. Cyberthreats reside in and propagate from everywhere in the CPS ecosystem: computers, software, networks, cloud datacenters, mobile devices, and social media websites. Consequently, it will take cutting-edge technologies and new methodologies, as well as greater collaboration between the public and private sectors, to deal effectively with these threats.

At the International Conference on Cyber Security at Fordham University (www.iccs.fordham.edu), researchers and practitioners from academia, government, and industry working toward the goal of a secure and sustainable CPS ecosystem explored global solutions to emerging cyberthreats: cyberattacks and cyberexploitations. The four articles in this special issue of *Computer* were presented, in preliminary versions, at the conference and represent the forefront of cybersecurity R&D.

IN THIS ISSUE

In "Rethinking Computers for Cybersecurity," Ruby B. Lee of Princeton University argues that with so many critical functions now vulnerable to increasing attack in cyberspace, software security measures are no longer sufficient. Computer architectures must be engineered from the foundation to promote hardware-enhanced security—for example, creating a combined hardware–software architecture to support self-protecting data, secure enclaves for executing trusted software components, and new hypervisor models for more security in cloud environments. A more fundamental goal is to engineer secure hardware that can itself limit security breaches, such

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GUEST EDITORS' INTRODUCTION

ABOUT THE AUTHORS

D. FRANK HSU is the Clavius Distinguished Professor of Science at Fordham University. His research interests include combinatorial fusion algorithms, interconnection networks, and data analytics. Hsu received a PhD in combinatorial mathematics from the University of Michigan. He is a Fellow of the Institute of Combinatorics and Its Applications, the New York Academy of Sciences, and the International Institute of Cognitive Informatics and Cognitive Computing. Contact him at hsu@cis.fordham.edu.

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as the cache side-channel attacks that today's cache architectures allow.

In "Protecting Websites from Attack with Secure Delivery Networks," David Gillman, Yin Lin, Bruce Maggs, and Ramesh K. Sitaraman survey the most common attacks against mission-critical websites and strategies for their mitigation. They then present an optimal network architecture for secure content delivery and, using a real-life case study of a series of major attacks launched against websites hosted by Akamai Technologies, illustrate the network's operation and effectiveness.

In "Denial and Deception in Cyber Defense," MITRE's Kristin E. Heckman, Frank J. Stech, Ben S. Schmoker,

and Roshan K. Thomas explore the use of cyber denial and deception, a key component of a new cybersecurity paradigm that stresses the need to proactively investigate and engage adversaries to influence their immediate or future moves to the defender's advantage.

In "Implementing the Federal Cybersecurity R&D Strategy," the Networking and Information Technology Research and Development (NITRD) Program's Tomas Vagoun and George O. Strawn discuss the first Federal Cybersecurity R&D Strategic Plan, issued in 2011. Drawing on significant collaboration among US government agencies, private industry, and academic research institutions,

this framework for innovative cybersecurity research aims to fundamentally improve the security, safety, and trustworthiness of the nation's digital infrastructure. The authors also describe R&D examples from the various organizations working to fulfill the plan's strategic goals.

This special issue of *Computer* focuses on four aspects of achieving a safe and stable CPS ecosystem: enhancing hardware security, re-architecting content delivery networks, implementing proactive defenses, and increasing collaboration among academia, government, and industry. However, cybersecurity researchers and practitioners are also exploring other topics, such as how to manage the scalability and heterogeneity challenges arising from big data and the Internet of Things. The confluence of these two trends—for example, in smart cities—will likely upend the cybersecurity landscape for decades, and is sure to be the subject of future conferences and special issues of *Computer*. 

ACKNOWLEDGMENTS

We thank the authors, reviewers, and editors involved for their energy and efforts to make this special issue possible and successful. In particular, we thank Sumi Helal, *Computer's* editor in chief, for his advice and encouragement in preparing the articles for publication.



Selected CS articles and columns are also available for free at <http://ComputingNow.computer.org>

THE FOLLOWING IS QUOTED FROM THE IEEE WEB SITE:

“Celebrating electrical engineering publishing excellence

“Since it first appeared as the Proceedings of the IRE in 1913, the Proceedings of the IEEE has been the leading journal to provide an in-depth tutorial and review coverage of the technical developments that shape the world.

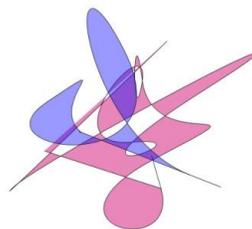
“This journal continues to offer review and survey articles of broad significance and long-range interest in all areas of electrical, electronics, and computer engineering.

“The journal holds the distinction of having the longest useful archival life of any electrical-engineering (EE) or computer-related journal in the world. According to the 2011 Journal Citation Reports (JCR), the Proceedings of the IEEE has a high Impact Factor of 6.810, ranking it second among all EE journals.”

If you examine copies of the Proc. IEEE journal you will notice that many of them contain articles that survey state-of-the art electrical and electronic technologies. They are written by people who themselves are immersed in the development of such technologies, from the concept to a finished product. The quality of these papers is superb. However, there is a problem with them. Often they are not thoroughly read and understood by managers, especially those who allocate funds for specific research areas. The technologies emerge and develop at lightning speed and the managers, burdened with their administrative responsibilities cannot keep up with them. In reality, it is humanly impossible to be aware of all technologies even in your own field and the alphabet soup of terminologies used therein. But we certainly want the fund managers to be aware of what is going on so that they can examine the importance of requests for money and human resources from researchers (presumably members of the IEEE), and give that go ahead to the proposed

projects. The situation is complex and chronic shortage of funds makes it more so.

To alleviate this problem the editors of the Proceedings commission contributing editors to digest the contents of such papers and write an introduction (or prolog) that is clearly understood by non-specialists that include managers and fund allocators who having to simultaneously focus on multiple specialties may overlook the importance and complexity, and future revenue generating technologies. This editor is one the contributing editors of the Proceedings. His training has been in physics, electronics and communications. He earned his BSc and PhD degrees from Imperial College, London. He was the chair of the Life Members' Affinity Group (LMAG) for several years and this is year he has again been appointed the acting chair by the Section chair. Dutta-Roy is also the Historian of the Section



The recent introduction that this editor wrote was for a paper by Hugh Griffiths, IEEE Fellow *et al* in Proc. IEEE January 2015, Vol. 103, No. 1: "Radar Spectrum Engineering and Management: Technical and Regulatory Issues." RF Spectrum is a free commodity we inherited from nature. We cannot change a bit of it. For this reason the *use* of the spectrum has become so expensive. Individuals, small and big businesses want a piece of the pie. Radio and TV broadcasts, cell phone companies (4G and 5G etc.), police, military, WiFi, WiMax hotspots, radar—all need radio spectrum. The governments make big money by selling the spectrum to communications companies flush with money. As a result, there is a tremendous pressure on public

communications and radar services. But these services are essential to our safety and security. Look at the picture below. It shows the sky over the USA on a normal weekday. Those fireflies are airplanes taking off, in flight or landing. We need radar of various types using various frequencies to take us up and bring us down. But because of the financial pressure some of the frequencies that were reserved for radar have been allocated to other purposes too. Radar has been downgraded to the position of secondary user. The main paper by Griffiths discusses these problems and suggests solutions. Hope that you will read the prolog and, if the topic covers your interest please read the main article. Thanks!



The sky over the USA on a normal weekday (Photo courtesy: Flightradar24.com)

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Proceedings OF THE IEEE

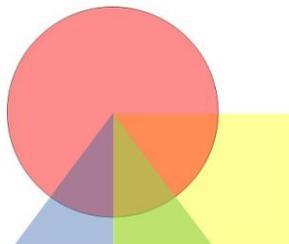
Software-Defined Networking

Radar Spectrum Engineering and Management

Spin-Based Computing

Point of View: Automating Analytical Homework

Scanning Our Past: The First Man-Made Memristor: Circa 1801



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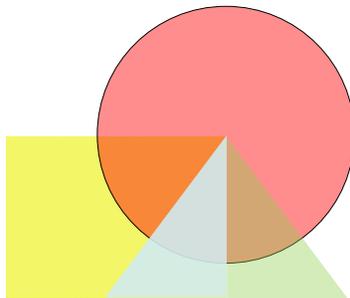
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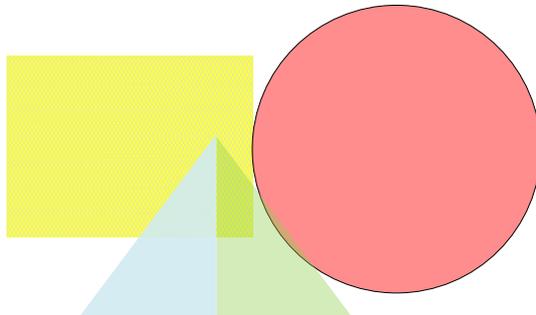
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On the Cover: Our cover this month highlights the software-defined networking paper which offers a comprehensive survey of SDN: its context, rationale, main concepts, and distinctive features.



PROLOG

An introduction to the paper by Griffiths, Cohen, Watts, Mokole, Baker, Wicks, and Blunt

Radar Spectrum Engineering and Management: Technical and Regulatory Issues

BY AMITAVA DUTTA-ROY

I. USE OF ELECTROMAGNETIC WAVES IN REMOTE DETECTION OF OBJECTS

Most of us are familiar with images of radar sweeps and expressions like "on the radar screen" or "operating below the radar," etc. The concept behind the detection of objects by electromagnetic (EM) waves as a tool, however, has been with us for a long time. As early as in the late 1880s, the German scientist Heinrich Hertz (whose name is famously linked with the unit of frequency Hertz) demonstrated that metallic objects reflected EM waves. Christian Hülsmeyer, also German, in the early 1900s, applied those characteristics of EM radiation to develop a system that enabled ships, under conditions of poor visibility, to avoid colliding with others.

II. WORLD WAR II AND BIRTH OF MODERN RADAR AND ITS MANY USES

However, the remote detection technology, later coined by the U.S. Navy as radar (acronym for radio detection and ranging), gained much importance during World War II (WWII). After a period of rushed and intense research (1934–1939), scientists in the United Kingdom and the United States successfully developed radar systems that made a decisive contribution to the outcome of the war.

Radar technology has come a long way since the days of WWII. Now it does not only detect aircraft in the sky but also helps us in other situations. Missile detection, police

speed traps, remote sensing of Earth resources, collision avoidance (e.g., autos, ships, pleasure boats, and airplanes), ultrawideband search through debris after earthquakes (Haiti), and other disasters (e.g., the September 11 terrorist attack and the vanished Malaysian MH 370 and downed AF 447 flights) and weather tracking are some typical examples of those situations (Fig. 1). More applications of radar such as in driverless driving loom are on the horizon.

Radar technology has come a long way since days of World War II. Now it does not only detect aircraft in the sky but also helps us in other situations.

III. WHY RADAR ENGINEERING AND SPECTRUM MANAGEMENT ARE IMPORTANT?

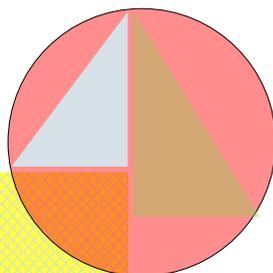
What is then the radar spectrum management? Why should it be important to the concerned citizens in a manner similar to that which invokes their passion for the Net neutrality?

The paper by Griffiths *et al.* more than adequately describes the present situation and cautions against the consequences if we do not pay enough attention to it. In addition, the paper addresses experts immersed in radar technologies, acronyms, standards, and conventions. Here we will offer a bird's eye view of the elements behind radar technology for better appreciation of the Griffiths *et al.* paper that follows. Our purpose here is to inform the nonspecialists and help senior executives and academics recapitulate their past readings on communications engineering. Because of the lack of time or pressure at work in their managerial roles, the knowledge they acquired during their student days may have gone rusty. Reading about those basic ideas again may encourage them to refer the main paper to their specialist colleagues, team members, decision makers, and allocators of R&D funds who may want to delve deeper before they

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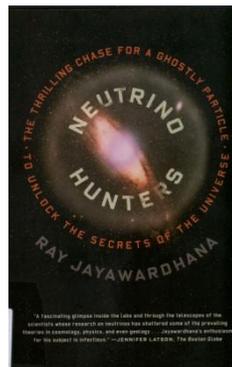




In spite of the onslaught of online news, blogs, ads, audio and video clips on our eyes, ears and minds there is no shortage of publication of meaningful books both online and printed. Of course, many favorite neighborhood and specialty bookstores have closed their doors for good. But a visit to your nearest Barnes & Noble super bookstores will convince you the people still browse through books and spend their money to buy books they like. Only the distribution channels have changed. It is debatable if it has been good or bad. If you do not want to move from your computer and visit a bookstore just log on to the Web site of Amazon.com and other online outlets. You will be amazed to perceive how thriving the book writing business still is. Nothing can replace the tactile and olfactory impact of a new book or that of even an old one. If you are reading a book on history, philosophy, current trends in STEM topics and like it please share it with us. Only by sharing such knowledge we can encourage others to read and broaden their horizons. We do not want to be passive engineers but very active ones!

My previous training in physics propels me to read more on topics that I had ignored earlier or did not quite understand. Now I realize why the Austrian novelist Marie von Ebner Eschenbach ((1830-1916) wrote: “In youth we learn and in age we understand.” I try to read several books during my waking hours. I may read one for a couple of hours and then jump to another and later switch to the first one and so on. Subways and buses are excellent places to read. My former professor Colin Cherry (1914-1979) the famous British cognitive scientist, contemporary of Claude Shannon, and the author of *On Human*

Communication, the first major work on the topic, used to live in Guildford, Surrey in England, some 27 miles from London. He used to commute to the big city by suburban trains. Once I asked Prof Cheery how he could manage the time to write such thick tomes (he authored 4 books and numerous scientific papers). In reply he told me that it would be impossible for him to get the time if he did not take the train every day. The train rides were his oasis of concentration, free of other distractions. Anyhow, now in Manhattan-bound F trains I read: “*Neutrino Hunters: The Thrilling Chase for a Ghostly Particle to Unlock the Secrets of the Universe*,” by Prof Ray Jayawardhana, ISBN 978-0-374-53521-6. Dr Wardhana is the dean of Sciences and professor physics at York University, Toronto, Canada. In this book, the author takes the reader by the hand and introduces him/her to the world of (in his words) the “cosmic chameleons.” He tells the fascinating stories



and personal interactions of some of the best minds the world had seen: Paul Dirac, Albert Einstein, Wolfgang Pauli, Enrico Fermi, Bruno Pontecorvo. . . and many others, too numerous to mention here, how they conceived the idea of the existence and how to this day their disciples are following their trails in Antarctica, CERN, Geneva, in a mine in Japan, under the water near China and in

Italian tunnels in search of the neutrinos, that are said to have been created within a fraction of a billionth of second after the Big Bang. Mind boggles! I am enjoying that cosmic trip backwards in time. So will you once you put your hands on the tiny paperback. By the way, a I read I read I read a large number of engineers have found work in all these projects to hunt the neutrino.

EVENTS AT A GLANCE

In the following we publish a list of events (presentations and seminars etc.) offered by the IEEE its NY Section, and other entities in NYC or in its vicinity. Most are of technical

in nature and many offer credits (CEU/PDH) toward PE licensing requirements.

Date, Time, Venue, Special requirements	Sponsor/s, Topic, Abstract (if available), and speakers
<p>Wed, 3 June, 2015 Iris & B. Gerald Cantor Film Center New York University 36 E 8th Street, New York, NY (btn University Place and Greene St.)</p> <p>.30 PM Social Hour 6:15 PM SMPTE Business 6:30 PM Program Begins 8:30 PM Program Ends</p> <p>Guests and Non Members Welcome! Refreshments will be served! Please write to smpteny@gmail.com for reservation</p>	<p style="text-align: center;">Society for Motion Pictures and Television Engineers (SMPTE)</p> <p style="text-align: center;">HDR: More Challenges in Post Production</p> <p>Abstract</p> <p>The promise of HDR and the invention of new methods to wrangle it through post production is the hot topic for June. Presenters will outline its technical aspects and discuss practical considerations of delivering HDR. We will mix up engineering and in-the-trenches perspectives so don't miss this unique event!</p> <p>Speakers: Katie Hinsen, Light Iron, Blue Collar Post Collective Mark Schubin</p> <p>Panelists: Joe Beirne, Technicolor Postworks John Dowdell, Goldcrest Post Nat Jencks, Outlier Post Tim Spitzer, Jigsaw Productions</p>

Wed, 10 Jun, 2015
5:00pm-7:30pm
900 Third Avenue, 17th floor
Register with:
Marty Izaak
martyizaak@verizon.net
917 267 0235 (x 133)

IEEE Consultants' Network and PACE (both of NY Section) and Women Builders Council

Savvy Social Security Planning for Retirement

This presentation will help engineers and consultants to better understand the benefits available from Social Security and planning towards retirement

The meeting outline:

- Learn the five factors when applying for benefits
- When to delay benefits
- How to minimize taxes of SS benefits
- How spousal benefits work
- How employment affect benefits
- How survivor benefits work
- How divorced spousal benefits work
- What to do if you have income from pension or IRA's

Wed, 17 Jun, 2015
Registration and Networking
11.30 am-12:00 noon
Presentation
12:00noon- 1:00pm
Reservations are simple – just e-mail Michael Scarano at scaranom@same-nyc.org
Indicate whether or not you wish to receive a PDH certificate.
Bring your coffee, soda, or sandwich.... ATTENDANCE IS FREE
Duane Street visitors' entrance. Have a photo ID and this flyer. Questions? Contact Michael Scarano at scaranom@same-nyc.org

Society of American Military Engineers (SAME), NY Post. and the IEEE

Co-sponsored by the SAME NYC Post Small Business and Environmental Affairs and Advanced Technologies Committees and IEEE

Hosted by the US Army Corps of Engineers, NY District

PANAMA CANAL EXPANSION PROGRAM

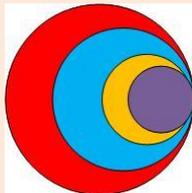
Abstract

The Panama Canal Expansion Program is a globally significant transportation project that will permit more and larger ships to transit the canal and open up the shipping route to East Coast and Gulf Coast ports. This presentation will provide more details about the program status in anticipation of the first transit passage in April 2016.

Robert S. Bright, Founder & President of Talson Solutions, LLC (Talsion), will provide further insight to the Canal project. Talson is providing construction auditing and consulting services on the expansion project, working for the Office of Inspector General, Panama Canal Authority. Mr. Bright will highlight the details about the extent of Panama's port development, which plays a critical role in the national economy, and provide information about improvements being completed on the project, new channels, water conservation basins, and new technologies being leveraged.

Guest speaker:

Robert S. Bright is a construction auditor and capital project consultant with 33 years of auditing, engineering, litigation support, project management, risk assessment, and consulting experience. He has directed contract audits and special investigations of contractors and design firms in the commercial real estate, education, infrastructure, healthcare, mining, petroleum, retail, and transportation industries. Since 2008, Mr. Bright has supported the Office of Inspector General, Panama Canal Authority, for the \$5.2 billion Panama Canal Expansion Program. Mr. Bright holds an MBA in Finance from The Wharton School, University of Pennsylvania and a B.S. in Mechanical Engineering from Rensselaer Polytechnic Institute.



<p>Wed, 17 Jun, 2015 6:30pm 353 West 39th Street 3rd Floor New York To attend please send e-mail to: Mitchell Golner at: mitchel@iotcentral.co</p>	<p style="text-align: center;">Sponsor:</p> <p style="text-align: center;">MeetUp NYC IoT (Internet of Things)</p> <p style="text-align: center;">Meeting of entrepreneurs in search of partners and capital, job seekers or simply enthusiasts in the emerging technologies MeetUp NYC IoT is supported by the IEEE Standards Association</p>
<p>Thu, Jun 18, 2015 Registration and Dinner: 5:30pm-6:00pm Presentation: 6:00pm-7:30pm National Grid Office OneMetro Tech Center, Brooklyn, NY 11201 – The building is located on Jay Sreet across the street from NYU Poly. Due to building security requirements, ALL attendees whether paying or not MUST pre-register by Tuesday, June 16th, 2015, so that security passes can be arranged. You can register by calling 347-593-9744 or e-mailing Mukhles Rahman at zmur766@yahoo.com</p>	<p style="text-align: center;">Sponsor: ASME Metropolitan Section</p> <p style="text-align: center;">Power Generating Asset Management - Challenges and Solutions</p> <p>In this presentation, Komandur SunderRaj will discuss maximizing power generating asset value. With the power industry undergoing transformative changes, power companies are grappling with several issues relating to people, process and technology. Knowledge management and doing more efficiently with less seem to be the order of the day. The speaker will tailor his presentation to issues and solutions to maximizing power generating asset value.</p> <p style="text-align: center;">This presentation carries 1.5 pdh points for the attendees</p> <p>Free to all Student Members and ASME Members, \$20.00 for all other attendees - to be paid at door by cash or check only.</p>

Tue, Jun 23, 2015

Refreshment and Networking

5:00pm

Presentation

5:30pm-7:00pm

ConEd building

4, Irving Place (corner East
14th St., one block from Union
Square)

RSVP to:

Arnold Wong,

wongar@coned.com

For security reasons no walk-
ins will be allowed

IEEE NY Section PES/IAS/LMAG chapters

HIGH TEMPERATURE INSULATION FOR MOBILE TRANSFORMERS

Abstract:

This presentation will focus on high temperature insulation systems and their use in Mobile Transformer solutions. It will specifically look at how hybrid insulation packages, or complete high temperature insulation packages influence performance and design characteristics. For mobile transformers, size and weight are very critical aspects of the design that determine how easily, or difficult, the mobile is to use. Constraints from local DOT, as well as substation size and access, typically require these units to be as small and compact as possible. By using high temperature insulation, one can allow for higher temperature rises of the windings, and therefore keep the units small. Topics covered at the presentation will include discussion of IEEE std C57.154-2012, *IEEE Standard for the Design, Testing, and Application of Liquid-Immersed Distribution, Power, and Regulating Transformers Using High-Temperature Insulation Systems and Operating at Elevated Temperatures*. Primary differences between high temperature designs and standard thermally upgraded designs will be discussed, and finally, the different products that are available in mobile form will be explored.

Speaker:

Myron B. Bell, PE is an avid participant and supporter of the IEEE/PES Transformer Committee, working with the standards committee and his peers to move the industry forward in quality, reliability, and improvement. He is a licensed PE in the state of Virginia and received his BS in Electrical Engineering from Virginia Polytechnic Institute and State University in 1995. Bell has been with Delta Star, Inc in Lynchburg Virginia since 2009, starting his career there as a controls testing engineer. Since that time, he has held the positions of HV Test Engineer, HV Test Lab Manager, Operations Manager, Customer Solutions and New Product Development Manager, and is now the Director of Technical Sales. His primary objectives now are to support the sales staff in areas of manufacturing capabilities and processes, specification improvement reviews, and participation in events such as this, to help with customer product education. Bell and his family enjoy hiking, fishing, golfing, and the occasional motorcycle ride

**Tue through Thu
23 Jun: 8am-4pm
24 Jun: 7:30am-6:30pm
25 Jun: 8:30am-2:30pm
For tech writers only**

**Consumer Electronics Show Week in New York
Press conferences and preview of CES 2016
(CES is supported by the IEEE)**

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THIS IS THE END OF THIS MONTH'S NY MONITOR

Thank you for reading!