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Welcome to Our CES Show Issue

By Peter Corcoran

As we move into the fall, it is time again to start looking forward to the annual IEEE Consumer Electronics Society (CES) trade show that serves to showcase new and emerging developments in consumer electronics (CE). It also acts as a gathering point for many of us in the industry. This is a chance to schedule important business meetings and also to meet old friends. It is an exciting time of year for both enthusiasts and those of us who have focused our careers on CE.

What will be the main theme of the keynotes this year? Which new innovations will catch our imaginations and make headlines from CES? Who is going to announce new products and services at the show? Well, there is not much point in being an editor if you don't have a bit of fun from time to time, so I am going to take a shot at offering a couple of my own selections that I think will be the new "diamonds in the rough" this year and also a couple of "silicon gooseberries."

DIAMONDS IN THE ROUGH

What is going to be exciting and break new ground this year? I am going to take a few pitches here at a number of different areas of CE. Let us start with the gaming industry.

DIAMOND NUMBER 1: THE STEAMOS, STEAM BOX, AND CONTROLLER

Yes, I think Valve is going to make a big hit here. Not the PlayStation 4 (PS4) or the Xbox One, but the Steam Box from Valve is going to be a big hit in the gaming sector. The reason is because Valve has built its success on blending social networking with an iTunes-like cloud distribution for personal computer (PC) games. The company has realized that PC gaming is on a downward trend, and they have had the vision to stage a move into the living room. In the process, they are up against both Xbox One and PS4, but neither of those devices offers a technology blend that can compete with Valve. For boldly going where only mega-corporations have dared to go—into our living rooms—this year's first CES diamond goes to Valve.

DIAMOND NUMBER 2: ZOOM LENSES FOR SMARTPHONES

As discussed in [1], smartphones are very close to replacing a stand-alone camera. For most of us, the smartphone is the camera we will always have with us, and for many situations, it is good enough to capture what is going on. However, I really do wish sometimes that I could zoom in a bit to get more coziness in some shots or to get closer to the action in others.

If you feel the same way, you will have wondered why someone does not put a miniature zoom camera into smartphones? The Nokia PureView technology has taken a good stab at

this, using a 40-MP sensor, but you are still relying on a digital zoom. And I don't like those add-on lenses—they defeat the whole idea of a smartphone that can fit in your shirt pocket.

I believe that in 2014, we will see genuine miniature optical zoom camera modules appearing in our phones. And I think we may be quite surprised at the quality of some offerings.

DIAMOND NUMBER 3: SMART CARS

I have been waiting for nearly 20 years to see the smart home become a reality [2]–[4], but now I am thinking it will happen first in our home-away-from-home, the automobile. In 2012, the first major display of automotive CE technology was presented, and this year a lot more examples of smart automotive systems will be discussed. These will range from driver alertness monitoring to biometric access, and my favorite is the use of gestures to control and actuate within the vehicle.

A lot of people get too excited about gesture control in the home or the living room. The workflows and use cases just don't stack up to provide a good user experience. But in the automobile, it makes a lot of sense—you are focused on driving the vehicle so you don't want to be groping around for switches to control the air conditioner or change the audio/video <AU: Please check whether A/V is spelled out correctly as "audio/video."> source. Touchscreens with virtual buttons and no tactile feedback are going to lead to drivers looking away from the road and will eventually

be the cause of accidents. I am also not a fan of voice control, as you have to switch off the audio to issue commands effectively.

But I can see that hand and facial gestures provide a code that can be easily deciphered by a smart vision system (which is already monitoring for driver alertness in many vehicles). And you can make these gestures without being distracted from driving. I think this will not be the only “smart-car” tech we are going to see at CES, so diamond number three goes to the automotive guys.

THE SILICON GOOSEBERRIES

Sand is everywhere, and it is pretty cheap. But by the time you have converted it into state-of-the-art electronics, it would have consumed a huge amount of energy and human effort [5]. Some things really are just a waste of sand—the following are our silicon gooseberries for 2014.

GOOSEBERRY NUMBER 1: BIGGER TV DISPLAYS

I am sure we will see 8K television (TV) displays at CES this year, but the real question is why? Do consumers really care? Let us think back just a few years.

First, we had 3-D TV in 2011—a technology that got a big boost from the movie *Avatar*, but ultimately failed, not because of the technology but because there was not enough “good” content. Then, we had the introduction of smart TV, which was intended to offer a conduit for streamed Internet TV and a range of other Internet-based services. But it was poorly presented and offered neither a good way to interface with the Internet nor a good way to access content.

Now we are being offered 4K TV displays? Where is the content? Netflix estimates that it will require a minimum of 15 Mb/s data rates to achieve real-time streaming of 4K TV and that would not be practical to roll out for a few more years. I do understand that there will be some 4K services in countries such as Korea—probably the most Internet-connected country worldwide. But for those of us who live elsewhere, it will take at least another one to two

years for the content industries to catch up with 4K. Therefore, consumers are just not going to care about 8K—most of them are only now starting to buy Blu-ray players and disks for the established base of full-HD displays.

For the last three to four years, the display industry just seems doomed to repeat the same mistake (in a different way) year-in and year-out in a quest for consumer traction. So when you begin to see those CES press releases for 8K TV displays, you will understand why I am awarding the first Gooseberry to flat-screen display manufacturers. Sometimes it just makes more sense to sit and wait.

GOOSEBERRY NUMBER 2: SMART GLASSES

I actually received funding in the late 1990s to do some university research into heads-up displays. The tech was definitely a lot cruder, and in those days, it was difficult to see how it might become a practical consumer technology. I also found out that there were other researchers in this field, in particular Steve Mann (<http://scholar.google.com/citations?user=7bmQ4FgAAAAJ&hl=en>), who is considered the father of wearable computing. Steve recently wrote an interesting critique of current wearable glasses [6]. Given his career-spanning work on wearable vision systems and the fact that he has also been wearing such systems 24/7 for many years, it makes sense to respect Steve’s views on this nascent technology.

This is a technology that could have many subtle side effects on users, and if industry pioneers such as Steve feel there are important issues that need to be resolved, I feel that manufacturers should hold back for long-term trials of this technology. In this case, a Gooseberry is awarded for disregarding the advice of an industry pioneer when designing new CE technology.

IN THIS ISSUE

We have an interesting selection of articles this issue, featuring energy harvesting to low-power Bluetooth and concepts for next-generation device connectors. We also have a range of reports on many of the new conferences

sponsored by CES, a “Soapbox” column presenting a challenge to the press, an “IP Corner” starring the “Gruffalo,” a follow-up to our award-winning “Tablet Smackdown” article, plus our regular columns.

FEATURE ARTICLES

BLUETOOTH SMART

Our first feature is from Joe DeCuir, vice chair of the Bluetooth Architectural Review Board. This is actually the first of a two-part article. The Bluetooth industry consortium had defined a new radio in Core Specification 4.0, originally known as *Bluetooth Low Energy* and rebranded *Bluetooth Smart*. This article will discuss low-energy radios, basic rate/enhanced data rate radios and “classic” Bluetooth, Bluetooth Smart specifications, power economics, and some details on how it works in practical embodiments. A follow-up article in our next issue will look at some newer features of Bluetooth Smart that are not yet released and explore a range of application areas for this next-generation consumer technology.

SMACKDOWN 2: iPHONE VERSUS iPHONE

You may recall from our last issue that we received a really nice birthday gift in the form of an APEX Grand Award for Publication Excellence. This was the 25th annual APEX competition, and *IEEE CE Magazine* was commended for excellence in written communication and design. Our Grand Award was for the article “Repairability Smackdown: How Do the Latest Tablet Models Stack Up?” coauthored by Kyle Wiens and Peter Corcoran, from the January 2013 issue of *IEEE CE Magazine*. A year later and by some coincidence, Apple has just released two new iPhone models, and the iFixit team has fired up their time machine to be the first to tear these new models apart. So this issue we have a follow up—“Smackdown 2: iPhone versus iPhone”; same concept, same approach, some new cheesy puns and jokes, and many more pictures of naked electronics. You may hate our sense of

humor, but you gotta love all those stripped down electronics. Enjoy!

NEXT-GENERATION CONNECTORS FOR CE

Joshua Benjestorf is the chief executive officer (CEO) of NMC corporation and a keynote speaker at the IEEE International Conference on Consumer Electronics (ICCE) 2014. His article is aligned with his keynote talk and presents an interesting perspective on CE connectivity. Basically, as data buses and other internal device I/O gets faster, we are approaching a tipping point beyond which traditional connectors, based on the conductivity of metal-to-metal contact, will no longer be fast or reliable enough. Joshua presents the case for a new generation of connectors that will exploit their inductive and capacitive properties to carry higher-frequency and lower-power signals and data, an interesting and visionary perspective.

AN INTRODUCTION TO THE IEEE BIOMETRICS COMPENDIUM

The *IEEE Biometrics Compendium* is the first IEEE virtual journal. It is published quarterly and created by the IEEE Biometrics Council. Subscribers receive access to full-text PDFs of all articles referenced from the current and past years. The *Compendium* is an excellent resource to find all biometrics-related research publications in a single place, drawing its content from more than a dozen IEEE journals and transactions. Currently, it requires a paid subscription, but you may have access via your institutional library or corporate membership of IEEE *Xplore*.

CES is one of a dozen sponsoring IEEE Societies that created the original council. The *Compendium* highlights various specific areas in biometrics and contains commentary from subject experts of the IEEE Biometrics Council. You also get the benefit of all the expert editors and reviewers who are involved in the *Compendium* and whose mission is to bring you the best and most topical research in biometrics today. But it is very difficult to fully appreciate the nature and scope of this

material until you actually get to read a copy of the *Compendium*.

This article provides you with the next-best thing—a condensed and truncated summary of the latest issue. If you find some material related to your field of research in this article, it is very likely you will want to subscribe. A personal subscription for IEEE members is only US\$30.

SOAPBOX—SEPARATING FACT FROM FICTION

A recent report on the energy consumption of CE devices has suggested that the iPhone consumes more energy than two modern refrigerators. In this issue, our “Soapbox” author Jonathan Koomey, a well-known research fellow from Stanford University, comments on the endless proliferation of attention-getting “factoids” that “just ain’t so.” More importantly, he presents a challenge to the media: “How can we hope to address difficult issues like climate change when many journalists just aren’t able to evaluate technical claims with reliability?”

ENERGY HARVESTING

In this issue, the “Standards” column editor William Lumpkins has written a feature article that investigates Nikola Tesla’s dream of wireless charging of electrical systems and finds that it may be closer than we think. Lumpkins is a regular contributor to *IEEE CE Magazine*, and I would like to thank him for another interesting and informative review of trends in this area of the CE industry.

CE NEWS—CONFERENCES

Our Society has been busy over the last few years establishing a number of new international conferences. In 2014, we will have eight conferences sponsored by the CES:

- ▼ IEEE ICCE 2014 Las Vegas
- ▼ IEEE ICCE—China 2014 (Shenzhen)
- ▼ IEEE International Symposium on Consumer Electronics (ISCE) Spain 2014
- ▼ IEEE ICCE Taiwan 2014
- ▼ ICCE—Berlin 2014
- ▼ IEEE IGIC <AU: Please spell out IGIC.> 2014 (Illinois or Florida)

▼ IEEE Global Conference on Consumer Electronics (GCCE) 2014 (Makuhara, Tokyo)

▼ IEEE GHTCE <AU: Please spell out GHTCE.> 2014 (Shenzhen).

CES members are encouraged to attend at least one of these events in 2014. They not only serve as technical conferences but also provide a forum for Society members to meet and engage with their representatives on the Adcom and other IEEE bodies and initiatives such as Smart-Grid, Cloud Computing, and IEEE Standards.

In this issue, we feature news and articles from a number of key 2013 conferences and a preview of ICCE 2014 to be colocated, as usual, with the January CES Trade Show.

ICCE 2014

Stu Lipoff writes about “The End of Next Generation Mobility Innovation”—a preview of some of the events and activities at ICCE 2014. Tom Coughlin contributes the article “Converging on Consumer Needs,” which provides a suitable background to the IEEE Convergence Event to be held in conjunction with ICCE 2014 and the IEEE Future Directions initiative.

GCCE 2013

The GCCE is now in its second year and has quickly become quite a significant conference in terms of papers submitted and the number of delegates attending. While the conference will not begin until a couple of weeks after we go to press, your trusty editor has managed to obtain some information on the conference and pictures of the organizing committee.

Dr. Stefan Mozar, president; Mr. Stephen Dukes, vice president of the conference; and Tomohiro Hase have been the chief planners of GCCE 2013. A local Japanese team, headed by Prof. Hase and conference chairs Tomohiro Haraikawa and Takako Nonaka, provided the main execution and operational planning. These include Conference Chair Prof. Wen-Chung Kao and Technical Program Committee Chair Dr. Tae-Chan Kim; TPC vice-chairs Dr. Shingo Yamaguchi; and Dr. Kazuyuki Kojima with

organizing members from around the world. We offer heartfelt thanks to all of these tireless volunteers.

Thanks are also due to the following Japanese Societies: the Institute of Electronics, Information and Communication Engineers (IEICE), the Institute of Electrical Engineers of Japan (IEEJ), the Institute of Image Information and Television Engineers (ITE), the Information Processing Society of Japan (IPSJ), the Institute of Image Electronics Engineers of Japan (IEEEJ), the Japan Electronics and Information Technology Industries Association (JEITA), the Japan Electronics Show Association (JESA), the Communications and Information Network Association of Japan (CIAJ), the Chiba Convention Bureau and International Center (CCB-IC), the Game Amusement Society, the Japanese Society of Artificial Intelligence (JSIA), and the Computer Software Association of Japan.

ISCE 2013

The 17th ISCE 2013 was held from 3–6 June in Hsinchu, Taiwan. The ISCE was sponsored by IEEE CES and changes venue every year.

From this year's conference, we have two different perspectives, one from Dini Nuzulia Rahmah, a master's student at National Taiwan University of Science and Technology (NTUST), Taipei, Taiwan. Under the guidance of Prof. Kai-Lung Hua in the Video and Image Processing Laboratory, she has been studying techniques in digital imaging. Her coauthored paper "Photo Magician: Controlling Point of Focus and Depth of Field on an All-Focused Image" won the first Best <AU: Change okay?> Paper Award at ISCE 2013. Here we present her story and her perspective on the conference after successfully winning the Award. A second article presents the perspective of Dr. Fitri Armia, assistant professor at the Department of Electrical Engineering, Syiah Kuala University, Banda Aceh, Indonesia.

ICCE-BERLIN

At the ICCE-Berlin 2013 conference, there was a special IEEE Graduates of the Last Decade (GOLD) event for

young professionals and graduate students that attended the conference. The event consisted of two parts: the first part was a talk by IEEE CES President Stefan Mozar, and the second part was a visit to one of the landmarks of Berlin, the TV tower. This short article and accompanying photographs are provided by GOLD Chair Carsten Dolar. Thanks, Carsten!

REGULAR COLUMNS

In this issue, we have a number of our regular columns.

BITS VERSUS ELECTRONS

Bob Frankston provides his regular column, "Bits Versus Electrons," with his unique insights to various aspects of the CE industry. This time he turns his attention to the fictional character Jeeves, the butler, who has come to represent the attentive servant doing our bidding. But computers, as Bob reflects, are mindless and unlike Jeeves will follow our instructions literally.

So is the dream of a scriptable world in which we could add Jeeves-like intelligence everywhere going to fade away? Or maybe Bob has some ideas to keep it alive? Read his article to find out.

IP CORNER—PATENT PROSECUTION; THE ART OF HUNTING

Patents are legal documents, but they capture and preserve rights to important engineering ideas. For this reason, they are very important to the corporations and research institutions that employ engineers. In this column, we take a look at what happens up to three years after you have filed a patent when the patent office actually starts to examine your patent filing and decide if you actually had an invention and your claims are valid.

This process of examination, combined with mechanisms to allow your patent attorney to respond to the outcome of examination, is generally known as *patent prosecution*. In this issue's column, we work through different aspects of this process, assisted by an old friend from our childhood—"the Gruffalo."

REVIEWS

PRODUCT REVIEW

In this issue, William Lumpkins reviews the MobiAria from iLuv, a wireless Bluetooth speaker with near field communication (NFC) and a universal serial bus (USB) charging port. It is a sleek-looking speaker with a few touchscreen "buttons" on the top.

BOOK REVIEW

We also have a review in this issue of a new book available from the International Energy Agency (IEA) on the topic of *Electricity in a Climate Constrained World*. This is a very useful text for anyone concerned with energy issues. In addition to the usual hard data and statistical analysis, this text also contains a series of interesting and thoughtful articles including one that asks, "How can we make an Internet-surfing microwave oven go to 'sleep'?" A very thoughtful and topical question for CE systems designers and engineers!

You can buy an ePub version of this book direct from the IEA Web site, or a print copy, if you prefer, from Amazon.

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The *Compendium* highlights various specific areas in biometrics and contains commentary from subject experts of the IEEE Biometrics Council.



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The Nokia PureView technology has taken a good stab at this, using a 40-MP sensor, but you are still relying on a digital zoom.



Valve has built its success on blending social networking with an iTunes-like cloud distribution for PC games.

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