

Quantum Computing in Consumer Electronics

By Saraju P. Mohanty

I welcome the readers to the last 2018 issue of CE magazine. With this November 2018 issue, we completed our first year with 6 issues published bimonthly. I would like to thank everyone associated in this effort, authors, associate editors, and reviewers. A special thanks goes to the IEEE production staff who do an excellent job to put the pages together to make a professional periodical out of individual manuscripts.

The current issue is dedicated for quantum computing. In the exiting digital electronic computing, bits of 1s and 0s (essentially binary or 2 values) are processed that uses two states of transistors (ON and OFF). On the other hand, in quantum computing, quantum bits (Qubits) which can be in superpositions of states are used thus allowing processing of several combinations of zeros and ones at the same time with very high speeds. Quantum computing uses quantum-mechanical phenomena including superposition and entanglement. There are many challenges to overcome before quantum computers become a consumer commodity. However, many obstacles have been overcome there are some quantum computing platforms are available, but at the research laboratories. Now the question arises what will be the impact of quantum computing? Obviously, the computing will be significantly faster, may be cheaper in terms of energy requirements. I suspect it will give stronger arsenal to attack security features of consumer electronics. Encryption is the corner stone of cybersecurity which is broken by the hackers over period of time using the existing classic digital computers. Quantum computers will make this security scenario worse which researchers need to address.

NEWS – GENERAL

Montreal Chapter Event on Smart Assistant Technology: This article presents Montreal Chapter event that discussed technology behind the growing presence of smart assistants entering into homes.

“Prepare slides first”, and “good logic” shall be given to you: This article discusses the Young Professionals (YPs) activity at the ICCE-Taiwan 2018.

ARTICLES – GENERAL

Consumer Applications of Quantum Computing: This is the theme article of this issue. This can be one of the earliest and high impact articles presenting the use of quantum computing for various consumer applications including cloud-based services, artificial intelligence, and on-line entertainment.

Nanoelectronic Security Design for Resource Constrained Internet of Things Devices: This article presents security system built from nanoscale electronic devices that could provide solutions for low resource security in emerging IoT devices.

How much smart is too much: This article presents an insight perspective of pros and cons of smart electronics such as smart phone, smart TV, and smart homes. These thoughts while presented for smart home are equally applicable for smart cars.

Leap Motion Targeting Performance in an Augmented Reality Workspace: This article presents an augmented reality environment has been implemented using leap motion (a 3D USB controller) in an android platform.

REGULAR COLUMNS

Bits Vs. Electrons -- From Net Neutrality to Seizing Opportunity: This article discusses the important issue of neutrality and its impact from different perspectives.

Energy & Security Matters -- A Computing Perspective towards Quantum Cryptography: This article is related to the theme of this issue. This article presents brief discussion on quantum cryptography which can be processed using quantum computers.

IP Corner -- Smart Product Recall: This articles presents smart product recalls as compared to the traditional product recalls.

SOCIOECONOMIC IMPACT

Brain Pacemakers as Consumer Electronics for Patient Care: Benefits, Risks and Challenges (Part 2 interview with Emeritus Professor Gary Olhoeft): This article presents the 2nd part of the interview of Emeritus Professor Gary Olhoeft (at the Colorado School of Mines) who received a deep brain stimulation (DBS) device on September 8, 2017, first part of which was in July 2018 issue of CE magazine.

SPECIAL SECTION

This special section titled “Secure and Resource Efficient Computing in IoT” presents a selected set of articles which present various advances in research related IoT which can have impact on the consumer electronics. I would like to thanks the Guest Editor for all the hard work for this strong special section which will be a good reading for CE community.

LOOKING FORWARD

I hope this issue dedicated to quantum computing and IoT helps a wider set of CE community to advance their knowledge. I also hope more and more themes will be covered in future in this CE magazine on the latest hot topics with the help of editorial board and authors around the globe.