

# Consumer Electronics Can Ensure Food Safety

By Saraju P. Mohanty

Welcome to the first 2019 issue of *IEEE Consumer Electronics Magazine*. We had a successful 2018, publishing six issues for the first time. The magazine has reached its readers more frequently with the latest technical trends as well as activities and news from the IEEE Consumer Electronics (CE) Society. *IEEE Consumer Electronics Magazine* has an impressive impact factor of 1.434 as determined by Clarivate Analytics (formerly IP Science of Thomson Reuters). It has improved by 24.3% from the impact factor of 1.153 last year. I would like to thank the CE Society president and vice president of publications for their support.

This issue is dedicated to food-quality monitoring. You may recall the January 2018 issue of *IEEE Consumer Electronics Magazine* focused on smart health care. The various aspects of smart health care include healthy living, assisted living, remote health care, stress management, and automatic health monitors. Good food is one of the most basic requirements for healthy living and a high quality of life in modern society. Ensuring the quality of food should be an integral part of both smart health care and smart agriculture. Smart agriculture can handle food supply chain security, combating counterfeits (including seeds, organics,

and vegetables), reduction of spoilage, enhancement of consumer knowledge and safety, and efficient food recall. Ensuring food quality at the source end through smart agriculture and the consumer end through smart health care serves as double assurance before food is consumed. Food can naturally decompose or become contaminated due to storage that exceeds its projected life span. Food can also be purposefully adulterated. Thus, requiring accurate and portable mechanisms to verify the quality of food products is vital before consumption for a healthy lifestyle.

## SOCIETY NEWS

### EMPOWERING FEMALE ENTREPRENEURS AT THE 2018 WIE ILC START-UP PITCH COMPETITION

The pitch competition organized by the IEEE Santa Clara Valley CE Society and Young Professionals Affinity Group is discussed.

### PAST CE SOCIETY PRESIDENT RECOGNIZED IN AUSTRALIA

CE Society Past-President Stefan Mozar has been presented with the David Robinson Award in Australia for his “Outstanding Achievements in Electronics Engineering.”

## CONFERENCE REPORTS

The activities at the International Symposium on Consumer Technologies, which took place in St. Petersburg, Russia, 11–12 May 2018, is detailed.

## FEATURE ARTICLES

### EAT, BUT VERIFY

This article addresses a very important area of smart city, smart health care, and smart agriculture: the critical problem of food and medicine counterfeits. Specifically, the authors present a nuclear quadrupole resonance spectroscopy-based food authentication method. The results demonstrate the potential of this method to lead to the development of handheld tools to detect counterfeit food products.

### A FRAMEWORK FOR EASIER DESIGNS

An approach for the development of intelligent interactive systems to make serious games faster is presented.

### A SMARTPHONE-BASED APPLICATION USING MACHINE LEARNING FOR GESTURE RECOGNITION

This article discusses a new machine-learning algorithm to identify hand gestures more precisely.

### MOVEMENT MODALITIES IN VIRTUAL REALITY

Evaluations of the movement modalities in virtual reality systems in terms of accessibility, comfort, and immersion are covered.

### LEAP MOTION PERFORMANCE IN AN AUGMENTED REALITY WORKSPACE

This article focuses on the design of an augmented reality environment using the

Leap Motion controller and an Android smartphone.

### **MOBILE NETWORK-AWARE MIDDLEWARE FRAMEWORK FOR CLOUD OFFLOADING**

This article presents middleware to make reward-based offloading decisions for higher energy savings.

### **ENABLING MILLIMETER-WAVE 5G NETWORKS FOR MASSIVE IOT APPLICATIONS**

Various challenges and solutions are discussed regarding communication and computation requirements of CE systems when millimeter-wave 5-G is deployed.

### **CLOUD-EMPOWERED, SELF-MANAGING WIRELESS SENSOR NETWORKS**

This article introduces a scalable system architecture that integrates a wireless sensor network into the Internet of Things to autonomously configure sensor nodes.

### **SMART RECEIVERS WITH MODULAR AND MULTIFUNCTIONAL FRONT- END BLOCKS**

This article presents the idea of a modular front end to convert a standard TV receiver into an intelligent communication hub.

## **SPECIAL SECTION**

The special section, “Electronics for Sustainable Development,” includes selected articles that present various advances in research related to sustainability. I would like to thank the guest editor for all of the hard work on this special section, which will be a good reading for the CE community.

## **IMPACTS**

“Caught in the Act” discusses the advantages and disadvantages of video surveillance.

## **COLUMNS**

### **IP CORNER**

“Smart Products Could Essentially Modify the Traditional Product Recall” discusses smart product recall as compared to traditional recall.

### **BITS VERSUS ELECTRONS**

“From Hi-Fi to CLI” presents views on various forms of interface to computing devices.

### **THE ART OF STORAGE**

“New Media Resolutions Drive Storage Requirements” discusses how the media quality drives the storage requirements.

## **HARDWARE MATTERS**

In “Signature-Free Watermark for Protecting Digital Signal Processing Core Used in CE Devices,” a signature-free watermarking technique for protecting DSP cores against counterfeiting is introduced.


## **ENERGY AND SECURITY**

“Security and Privacy Issues in Contemporary Consumer Electronics” presents various aspects of security and privacy issue in current generation CE.

## **CTA INSIGHTS**

“Standardization of Television Energy Consumption” presents standardization of television from an energy consumption point of view.

## **LOOKING FORWARD**

I hope this issue dedicated to food safety is useful for a wider set of CE communities to advance their knowledge. With the help of the editorial board and authors around the world, I would like to see this subject covered further as well as other emerging hot topics in future issues of *IEEE Consumer Electronics Magazine*. Thank you to all the authors, reviewers, and members of the editorial board for all of their support to make *IEEE Consumer Electronics Magazine* a great venue for technical dissemination and outreach. I wish you all a great 2019. 

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