

Video Cameras: An Omnipresent Consumer Electronics

By Saraju P. Mohanty

This issue of *IEEE Consumer Electronics Magazine* is dedicated to video cameras. Video cameras are nearly everywhere, including in TV studios, smartphones, doorbells, or even mounted on unmanned aerial vehicles. We trace the history of cameras, beginning with an all-electronics TV system, introduced in 1908, that used a cathode-ray tube for both imaging and display. Then various camera or imaging tubes, including iconoscopes, orthicon tubes, and vidicons, were used from time to time in the evolution of this high-impact technology. Next came charge-coupled devices and CMOS image sensors. CMOS image sensors made it possible for the cameras to be of any size, part of any device, and placed at any location. Monochrome and color cameras have been marketed, and the cameras have been both analog and digital. Of course, now digital cameras are replacing the analog cameras more or less in all applications. The cameras can be of different resolutions and quality. Along with digital cameras, video-compression technology has been evolving as well to meet the constraints for storage/memory cost and transmission bandwidth.

AWARDS

I congratulate the winners of the various recent awards presented by the IEEE Consumer Electronics (CE) Society.



Now digital cameras are replacing the analog cameras more or less in all applications.

IBUKA AWARD FOR 2019

The 2019 Ibuka Award was presented to Tomonori Aoyama and Takashi Hayasaka for pioneering contributions in superhigh-definition image technologies leading to 4K digital cinema and television.

CE SOCIETY FELLOWS FOR 2019

The following are the 2019 IEEE Fellows from the CE Society:

- ▼ Wen-chung Kao, for leadership in the development of electrophoretic display technology
- ▼ Seishi Takamura, for application of video coding.

CE SOCIETY OUTSTANDING SERVICE AWARD FOR 2019

The 2019 CE Society Outstanding Service Award was conferred to Michael Isnardi for contributions to a broad range of important activities in the CE Society, including awards committees, Advanced Television Systems Committee representation, and International Conference on CE (ICCE) technical reviews.

IEEE CONSUMER ELECTRONICS MAGAZINE BEST PAPER AWARDS FOR 2018

The following Best Paper Awards were presented for 2018 for *IEEE Consumer Electronics Magazine*:

- ▼ *First Prize*: “The Blockchain as a Decentralized Security Framework,” by Deepak Puthal, Nisha Malik, Saraju P. Mohanty, Elias Kougianos, and Chi Yang, March 2018
- ▼ *Second Prize*: “Everything You Wanted to Know About the Blockchain: Its Promise, Components, Processes, and Problems,” by Deepak Puthal, Nisha Malik, Saraju P. Mohanty, Elias Kougianos, and Gautam Das, July 2018
- ▼ *Third Prize*: “Intellectual Property-Based Lossless Image Compression for Camera Systems,” by Anirban Sengupta and Dipanjan Roy, January 2018.

IEEE TRANSACTIONS ON CONSUMER ELECTRONICS BEST PAPER AWARDS FOR 2019

The *IEEE Transactions on Consumer Electronics* Best Paper Awards were given as follows:

- ▼ *First Prize*: “A Novel 2D to 3D Video Conversion System Based on a Machine Learning Approach,” by José L. Herrera, Carlos R. del Blanco, and Narciso García, November 2016
- ▼ *Second Prize*: “Fast Scene Analysis for Surveillance & Video Databases,” by Solmaz Javanbakhti, Sveta Zinger, and Peter H.N. de With, August 2017
- ▼ *Third Prize*: “A Computation and Energy Reduction Technique for HEVC Intra Prediction,” by Hasan Azgin, Ercan Kalali, and Ilker Hamzaoglu, February 2017.

SOCIETY NEWS

THE YOUNG PROFESSIONALS EVENT AT ICCE 2019

This news item discusses CE Society Young Professionals activities held at ICCE 2019 in Las Vegas, Nevada.

THE MALAYSIA PROJECT COMPETITION ON THE IoT FOR HUMANITARIAN CAUSES

The Internet of Things (IoT) challenge organized by the CE Society Malaysia Chapter is presented in this article.

WORKSHOP ON CONSUMER TECHNOLOGIES—INVENT THE FUTURE TODAY

This article discusses the CE Society Malaysia Chapter activity on Industry 4.0.

FEATURE ARTICLES

THE DEVELOPMENT OF VIDEO- CAMERA TECHNOLOGIES

This theme article presents a historical overview of video cameras starting from their inception.

POINT-CLOUD COMPRESSION

This theme article presents the details of the first MPEG compression performed in the cloud, which will have an impact on next-generation videos.

NEXT-GENERATION VIDEO NETWORK DESIGN TENETS

In another theme article, the authors discuss requirements for next-generation video broadcast, which has increased demand for personalized services.

WHY PIEZOELECTRIC MATERIAL IS UNSUCCESSFUL IN INTERACTIVE DISPLAYS

The use of piezoelectric-based sensing in interactive displays, such as smart mobile phones, is presented.

DETECTING ABNORMAL MASSIVE CROWD FLOWS

This article discusses a method for estimation of unusual events from surveil-



I hope this issue with its theme of video helps a wider set of the CE community to advance its knowledge.

lance video for detecting abnormal massive crowd flows.

DATA PROVENANCE IN THE CLOUD

A blockchain-empowered data provenance architecture, called *BlockCloud*, in the context of cloud computing is presented in this article.

A HYBRID FRAMEWORK TO EVALUATE BREAST ABNORMALITY

The authors detail a framework for preprocessing and postprocessing for automated inspection of breast malignancy.

PARKING MANAGEMENT

A blockchain-based smart parking system that can preserve privacy of the users is presented in this article.

A BLOCKCHAIN PLATFORM IN CONNECTED MEDICAL-DEVICE ENVIRONMENTS

The authors discuss a blockchain for consumer-oriented medical devices to ensure the control of end users of medical devices in the context of cybersecurity threats.

WIRELESS CONSUMER ELECTRONIC DEVICES

Various impulsive noises and analysis of their effects on the performance of wireless CE devices are presented in this article.

PHYSICAL UNCLONABLE FUNCTIONS FOR ON-CHIP INSTRUMENTATION

The authors detail a physical unclonable function-based method for

secure on-chip communication within CE devices.

THE TOLLING OF BELLS

Various doorbell options are discussed.

COLUMNS

BITS VERSUS ELECTRONS

“As a Service?” presents the perspectives of options-buying services in the context of communications and the Internet.

THE ART OF STORAGE

“Giving Your Home an Edge” discusses the options of storage at the edge of the IoT with an emphasis on home media.

PROFESSIONAL DEVELOPMENT

“Entrepreneurs in Consumer Electronics: Steve Penrod of Mycroft AI” is an interview with the chief technology officer of Mycroft AI.

PRODUCT AND BOOK REVIEWS

TV OF TOMORROW

This article, closely related to the issue’s theme, presents future perspectives on TV.

BOOK REVIEW: COMPUTING IN GEOGRAPHIC INFORMATION SYSTEMS

This book on geographic information systems discusses its applications in smart cities, such as determining asset management for property owners and disaster management.

LOOKING FORWARD

I hope this issue with its theme of video helps a wider set of the CE community to advance its knowledge. I am working with our dedicated editorial board and worldwide researchers for more themes on the latest hot topics to be covered in future issues of *IEEE Consumer Electronics Magazine*.

