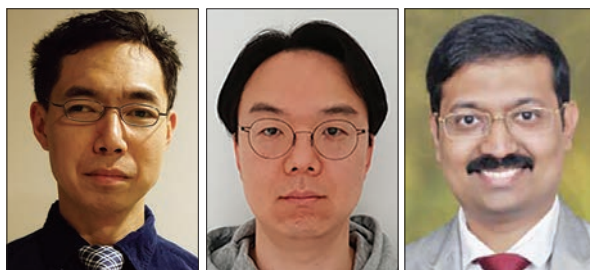


DESIGN AND IMPLEMENTATION OF DEVICES, CIRCUITS, AND SYSTEMS



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The Design and Implementation of Devices, Circuits, and Systems Series features original articles in various areas of telecommunication devices, circuits and systems with practical tips for design and implementation. The Series continues to attract contributions from a broad range of communications industry sectors such as healthcare, automotive, energy, agriculture, smart manufacturing, consumer electronics, smart city, VR/AR/hologram, drone, and consumer electronics. As the Series enters its third year, we are pleased to feature four articles mainly about design and implementation of wireless optical systems. Articles covering virtually any type of communication systems and applications can be considered for publication. Prospective authors are strongly encouraged to discuss their intended contribution with any one of the Series Editors prior to submitting an article in order to ensure that the article will be appropriate for the Series.

Driven by the broad interest from researchers and developers in academia and industry alike, this fifth publication of the Series appears three months after the previous publication in May. We continue to solicit contributions from different sectors across a diverse range of ICT applications. These articles are intended to provide practical knowledge for developing and optimizing communication products and services with an academically rigorous style and are also suitable for industry professionals. One of the key features of these articles is to conclude with “Lessons learned”, which contains important lessons from the design and implementation process and the key takeaways.

In this issue, four articles are featured which cover timely millimeter-wave communications as well as service delivery and antennas in the design and implementation of circuits and systems. One common attribute that all these articles possess is that they are tutorial in nature, targeting a wide range of audiences and providing a good overview of the state-of-the-art technologies in the design and implementation aspects of communications devices, circuits and systems.

The first article, “Advanced Receiver Architectures for Millimeter-Wave Communications with Low-Resolution ADCs,” introduces the use of low-resolution analog-to-digital (A/D) converters for mmWave receivers in an effort to reduce power consumption and studies the tradeoff between spectral and energy efficiency. The article also provides some key insights on tackling various challenges associated with circuit design and implementation by presenting theoretical and numerical results.

The second article, “A Robust Systematic Approach for Ensuring Optimal Telecom Service Delivery,” discusses the QoS and user satisfaction aspects of telecommunication service delivery from a system design and implementation perspective. This arti-

cle looks at telecommunication systems from a business service point of view by using churn prediction as a metric for measuring customer satisfaction, and applies the Churn Drift Detection Method (CDDM) through an industrial case study in Pakistan.

The next article, “mmWave 5G NR Cellular Handset Prototype Featuring Optically Invisible Beamforming Antenna-on-Display,” addresses the impact of link margin reduction in 5G mobile devices. This article focuses on the design and implementation of operating mechanism of mmWave 5G phased-array antenna-on-display circuitry along with the experimental results of foreside beamforming characteristics at 28 GHz.

This issue wraps up with the fourth article, “Implementation of Cloud-Based Cell-Free Distributed Massive MIMO System,” which takes an in-depth look at multiple-input multiple-output (MIMO) antenna design and implementation in a cell-free distributed cloud environment. This article also presents test results on the validation of supporting 5G NR communication.

BIOGRAPHIES

BERNARD FONG (bfong@ieee.org) received his B.Sc. degree in electronics from the University of Manchester Institute of Science and Technology and the Ph.D. degree in health information systems from the University of New South Wales in 1993 and 2005, respectively. He is a professor with Providence University and currently serves as a Series Editor for *IEEE Communications Magazine*, Executive Editor for *IEEE Consumer Electronics Magazine*, associate editor for the *Archives of Emergency Medicine and Critical Care, Anaesthesia, Critical Care and Pain Management; Cyber-Physical Systems, the Journal of Advances in Information Technology*, and *IEEE Transactions on Consumer Electronics*. He is the Chair of the System Biology and Biomedical Systems Technical Committee under the IEEE Systems Council. He is an author of the book *Telemedicine Technologies*, Second Edition (Wiley, 2020).

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