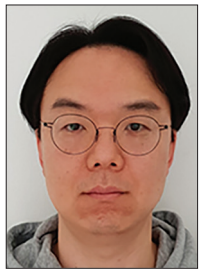
DESIGN AND IMPLEMENTATION OF DEVICES, CIRCUITS, AND SYSTEMS


Bernard Fong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The Design and implementation of Devices, Circuits, and Systems Series publishes original articles that cover a broad range of topics and application areas in telecommunication devices, circuits, and systems advances and developments.

This January 2022 issue features three articles that cover a diverse range of topics in the design and implementation of communication circuits and systems. These include the design and implementation of communication systems from a batched network coding perspective; the other two articles included in this Series are more oriented toward practical applications that cover a use case in infectious disease quarantine using dynamic geofencing and neuronal communications with memristive circuits.

The first article, "Network Communication Protocol Design from the Perspective of Batched Network," is contributed by Raymond Yeung, recipient of the 2022 Claude E. Shannon Award and the 2021 IEEE Richard W. Hamming Medal. It describes the optimization of network parameters such as throughput, latency, and operational reliability through a general network communication protocol design based on batched network coding (BNC).

The second article, "A New COVID-19 Quarantine Directive: QDex Evaluated Dynamic Geofencing," introduces an epidemic control scheme by using a performance scoring quarantine index. It documents the challenges as well as limitations in connection with the implementation of such scheme utilizing geofencing.

The last article, "A Brain-inspired In-Memory Computing System for Neuronal Communication via Memristive Circuits," proposes a novel circuit design of a multimodal signal processing system for neuronal communications. In addition, the article also discusses the implementation challenges associated with computational complexity as well as energy efficiency.

The Series welcomes contributions from various industrial sectors that cover virtually any type of communication system and application area. Prospective authors interested in submitting an article 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.

BIOGRAPHIES

BERNARD FONG (bfong@ieee.org) received his B.Sc. degree in electronics from the University of Manchester Institute of Science and Technology and his Ph.D. degree in health information systems from the University of New South Wales in 1993 and 2005, respectively. He is a professor at Providence University and currently serves as a Series Editor of *IEEE Communications Magazine*, Executive Editor of *IEEE Consumer Electronics Magazine*, Senior Area Editor of *IEEE Smart Cities eNewsletter*, and an 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.

HAESIK KIM (haesik.kim@vtt.fi) is a senior scientist of the 5G and beyond network team at VTT Technical Research Centre of Finland. He was with Samsung Advanced Institute of Technology from 2002 to 2006 and NEC UK from 2008 to 2009. He received his Ph.D. degree from Lancaster University, United Kingdom, in 2009. He is an author of the books *Wireless Communications Systems Design* (Wiley, 2015) and *Design and Optimization for 5G Wireless Communications* (Wiley-IEEE, 2020). He is a Series Editor of *IEEE Communications Magazine*: Design and Implementation of Devices, Circuits, and Systems, and also an Associate Technical Editor of *IEEE Communications Magazine*. He was a Vice-Chair of the 5G IA steering board. He has served as a Conference Co-Chair, Session Chair, and TPC member of major IEEE international conferences.

VYASA SAI (vyasa.sai@ieee.org) currently works for the Visual and Machine Learning IP Team at Intel, California. He received his Ph.D. from the Department of Electrical and Computer Engineering at the University of Pittsburgh, Pennsylvania in 2013. He also holds M.S. and B.Tech. degrees in ECE from the United States and India, respectively. He is the lead Series Editor for the Design and Implementation of Devices, Circuits, and Systems Series in *IEEE Communications Magazine*. He also serves as a Technical Committee member for *IEEE Circuits and Systems for Communications*, an Editorial Board member for the *International Journal of RFID Technology & Applications*, and an Associate Editor for *IEEE Access*, Elsevier's *International Journal of Computers and Electrical Engineering*, and *IEEE Communications Magazine*, and has served as a Guest Editor for Elsevier's *Computer Communication*, among others.