

# IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS



WWW.IEEE-CAS.ORG

A PUBLICATION OF THE IEEE CIRCUITS AND SYSTEMS SOCIETY

MARCH 2016

VOLUME 6

NUMBER 1

IJESLY

(ISSN 2156-3357)

## ISSUE ON EMERGING TOPICS IN MULTIPLE-VALUED LOGIC AND ITS APPLICATIONS

---

### GUEST EDITORIAL

Emerging Topics in Multiple-Valued Logic and Its Applications ..... *V. Gaudet, J. T. Butler, R. Wille, and N. Homma* 1

---

### TUTORIAL

A Survey and Tutorial on Contemporary Aspects of Multiple-Valued Logic and Its Application to Microelectronic Circuits ..... *V. Gaudet* 5

---

### PAPERS

Hardware Implementation of Associative Memories Based on Multiple-Valued Sparse Clustered Networks ..... *N. Onizawa, H. Jarollahi, T. Hanyu, and W. J. Gross* 13

Multiple-Valued Signaling for High-Speed Serial Links Using Tomlinson-Harashima Precoding ..... *Y. Yuminaka and Y. Iijima* 25

A Fixed-Point Squaring Algorithm Using an Implicit Arbitrary Radix Number System ..... *S. D. Gupta and M. A. Thornton* 34

Aspects of Reversible and Quantum Computing in a  $p$ -Valued Domain ..... *C. Moraga* 44

Quantum Actin Automata and Three-Valued Logics ..... *S. Siccardi and A. Adamatzky* 53

A Heuristic for Linear Nearest Neighbor Realization of Quantum Circuits by SWAP Gate Insertion Using  $N$ -Gate Lookahead ..... *A. Kole, K. Datta, and I. Sengupta* 62

LUT Cascades Based on Edge-Valued Multi-Valued Decision Diagrams: Application to Packet Classification ..... *H. Nakahara, T. Sasao, H. Iwamoto, and M. Matsuura* 73

Multilevel-Cell Phase-Change Memory: A Viable Technology ..... *A. Athmanathan, M. Stanisavljevic, N. Papandreou, H. Pozidis, and E. Eleftheriou* 87

---