Contents

January/February 2021 Volume 41 Number 1

Guest Editors' Introduction ot Interconnects 27

Ryan E. Grant and Manjunath Gorentla Venkata

Published by the IEEE Computer Society

Theme Articles

Onfigurable Network
Protocol
Accelerator (COPA)

Venkata Krishnan, Olivier Serres, and Michael Blocksome

15 Distributed Deep Learning With GPU-FPGA Heterogeneous Computing

> Kenji Tanaka, Yuki Arikawa, Tsuyoshi Ito, Kazutaka Morita, Naru Nemoto, Kazuhiko Terada, Junji Teramoto, and Takeshi Sakamoto

PCI Express 6.0
Specification: A
Low-Latency,
High-Bandwidth,
High-Reliability,
and Cost-Effective
Interconnect With 64.0
GT/s PAM-4 Signaling

Debendra Das Sharma

The Open
Domain-Specific
Architecture

Bapi Vinnakota, Ishwar Agarwal, Kevin Drucker, Dharmesh Jani, Gary Miller, Millind Mittal, and Robert Wang 37 DVL-Lossy: Isolating Congesting Flows to Optimize Packet Dropping in Lossy Data-Center Networks

Cristina Olmedilla, Jesus Escudero-Sahuquillo, Pedro Javier Garcia-Garcia, Francisco Alfaro-Cortés, José L. Sánchez, Francisco J. Quiles, Wenhao Sun, Xiang Yu, Yonghui Xu, and José Duato

45 Reliable and Time-Efficient Virtualized Function Placement

Roi Ben Haim and Ori Rottenstreich

54 Chiplet Communication Link: Bunch of Wires (BoW)

Shahab Ardalan, Ramin Farjadrad, Mark Kuemerle, Ken Poulton, Suresh Subramaniam, and Bapiraju Vinnakota

General Interest

61 ExHero: Execution
History-Aware
Error-Rate Estimation
in Pipelined Designs

Ioannis Tsiokanos and Georgios Karakonstantis

69 Cost-Effective and Flexible Asynchronous Interconnect Technology for GALS Systems

Davide Bertozzi, Gabriele Miorandi, Alberto Ghiribaldi, Wayne Burleson, Greg Sadowski, Kshitij Bhardwaj, Weiwei Jiang, and Steven M. Nowick



Image credit: © shutterstock.com/ktsdesign

COLUMNS AND DEPARTMENTS

From the Editor-in-Chief

4 Connectivity—More Needed Than Ever Before

Lizy Kurian John

Correction

83 Corrections to "Countering Load-to-Use Stalls in the NVIDIA Turing GPU"

Ram Rangan, Naman Turakhia, and Alexandre Joly

Micro Economics

86 Technology Policy Dilemmas in the New Administration

Shane Greenstein

