From the EIC

The Internet of Things

After last month's penultimate "50th Anniversary of DAC" Special Issue, it is only fitting that we follow through with the messages of positivity that emanated from the conference to set off the next 50 years. As such, the topics at hand for this month's Special Issue are at the forefront of what our industry has promised to deliver; thorough attention to developing the "Internet of Things" (IoT) and further integrating The Cloud into the modern world in safe, robust, and meaningful ways; ways that bring the cyber and physical worlds together such that they bring value to not only humans around the planet, but also to the natural environment that surrounds all of us. We present three articles that highlight these special interest topics, as well as four general interest articles that we hope will peak your interest on a broader spectrum.

We begin this issue with a collaborative work by an impressive team of authors from high-profile institutions across the United States. The article, appropriately titled "The Swarm at the Edge of the Cloud," addresses the rapid expansion of innovative devices that connect the cyber world (The Cloud) to the physical, and proposes an open platform to allow the safe and secure operation of these devices.

Following this, an article by Huo et al. highlights the participation of very low-power devices in the IoT, and proposes a middleware layer (rimware) to achieve the full potential of participation across multiple IoT domains while maintaining minimal code size and communication overhead.

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Third, an article authored by Jung et al. from Columbia University examines two elements of the cloud computing and embedded systems relationship, through a prototype of the networked virtual platform concept. The efforts result in improved usability, flexibility, and cost.

Next we move away from our special topics to introduce an article by Linder et al. that reports on a study on memory fault models and testing on embedded memories of automotive microcontroller devices, providing statistics that form a foundation for efficient test selection.

A second general interest article is by researchers from the Indian Institution of Technology Delhi and Washington State University. It examines the fascinating field of phylogeny reconstruction that can be made more efficient to better explain the evolutionary relationships among a set of species by using advances in wireless NoC platforms.

The following article, a collaboration by authors from Duke University and Huawei Technologies in San Jose, portrays a framework for evaluating and guiding a reasoning-based functional fault diagnosis system, using three complex boards in volume production as result examples.

Last, contributors from the University of Southern California and Seoul National University focus on designing fault-tolerant photovoltaic systems in ways that can detect and avoid cell faults without manual interventions.

We wrap up the issue with our traditional "Last Byte" column authored by Scott Davidson.

Coming out of the marking of 50 years of DAC in our last issue, in a way we view this issue of *D&T* as inaugurating the next 50 years. This issue shows a diversity of topics that matter now to industry and academics, and brings focus to the rapidly emerging IoT. We are pleased to continue to present general

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interest articles to complement our selected special topics, to provide our readers with a continuing, all-encompassing look at the most inventive and promising areas of work by leaders of our industry today. We hope you enjoy this issue and look forward to keeping you, our readership, in the loop in the coming months. ■

Sincerely,

André Ivanov
Editor-in-Chief
IEEE Design & Test