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EDITORIAL

A Foreword from the Editor-in-Chief

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ARTICLE INFO

Article history
Received: 25 October 2019
Accepted: 28 October 2019
Published Online: 31 October 2019

Welcome to the inaugral issue of Semiconductor Science and Information Devices.

It is expected that future telecommunication networks (5G and beyond) will host not only humans but also machines in the form of Internet of Things (IoT). Therefore, there is a growing demand for increased data rates, of the order of tens of gigabits per second for each device for streaming 8K video, latencies of less than one millisecond for autonomous driving and remote surgeries, increased device density over a square kilometer, millimeter wave frequencies (carrier frequencies in excess of 100 gigahertz) and last but not the least, having a large number of antennas on each device, in the form of massive multiple input and multiple output (MIMO) for the purpose of spatial multiplexing and increased data-rates.

All this calls for a close coordination amongst the telecommunications, VLSI and the microwave groups of electrical engineering. The objective of the journal is precisely to achieve this collaboration. The VLSI and microwave group would look into the miniaturization of the circuit components (the current state of the art appears to be 7 nanometer lithography and is expected to move towards 3 nanometer), increasing the processor clock frequency above the current 2.5 -- 3 gigahertz and improving the display technologies to support 8K video and above. The microwave group has the additional task of improving the propagation characteristics of millimeter wave frequencies, perhaps by using suitable reflectors and/or repeaters, to get a "rich scattering" wireless channel. The telecommunications group would develop optimum discrete-time signal processing techniques for providing secure and reliable telecommunications. Software defined radio (SDR) and new radio (NR) are recent paradigms, where sophisticated signal processing algorithms are expected to run on programmable hardware.

Of course, the scope of the journal extends well beyond these three areas and ventures into all areas of electrical and computer engineering. For example, artificial intelligence (AI) is expected to play a major role in 5G and beyond. The journal welcomes articles in all these areas.

I wish Semiconductor Science and Information Devices all success.

Sincerely
Kasturi Vasudevan
Editor-in-Chief

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Distributed under creative commons license 4.0 DOI: https://doi.org/10.30564/ssid.v1i1.1330