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EDITORIAL

Confluence of Encryption, Absorption and Sensation – Well Almost Nearly

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ARTICLE INFO

Article history
Received: 25 November 2021
Accepted: 28 November 2021
Published Online: 1 December 2021

Keywords:
Specific Absorption Rate (SAR)
Electromagnetic wave
Mobile base station
Public health safety
RF waves

In this issue, manuscripts have been published on a wide variety of topics, which demonstrates the large scope of *Semiconductor Science & Information Devices*. Even the authors are from diverse geographical areas! We continue to encourage such submissions on varied topics. In fact, much of the engineering today is multi-disciplinary involving close cooperation & collaboration among many fields & specializations. For example, it is hard to think of a mobile phone without the joint efforts of *discrete-time signal processing* [1], *microelectronics* [2,3], *power electronics* [4,5], *display technologies*, *microwave* [6] (together classified as the *technical* group) and last but not the least *marketing* groups. In fact, one can go a step further and classify the *technical* group into *R&D* and *production (or manufacturing)* groups.

The article "*Extracting Cryptographic Keys from .NET Applications*" in this issue deals with cryptography, which is essential for the safety and security of information exchanged between transmitters and receivers. In particular, the authors expose a security vulnerability and propose an elegant solution. The article titled "*Measurement Analysis of Specific Absorption Rate in Human Body Exposed to a Base Station Antenna by Using Finite Difference Time Domain Techniques*" analyses the effect of radiation on the human body, when in close proximity to the antenna elements of present day mobile communication systems. This work assumes significance when most people are so attached to mobile phones in the era of 5G and beyond [7]. Future wireless communication systems would employ antenna arrays (massive MIMO) rather than single antennas at the transmitter and receiver, in order to exploit properties of beamforming and spatial multiplexing. Beamforming is a technique of focussing electromagnetic signals on a particular location. For example, a base sta-

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 DOI: https://doi.org/10.30564/ssid.v3i2.4142

tion would want to focus the signal on a particular user equipment, rather than radiating the signal in all directions. However beamforming has low spectral efficiency (bits/transmission). Spatial multiplexing could be used to increase spectral efficiency. Spatial multiplexing relies on diffuse (not focussed) transmission, for effective operation [8,9]. In any case, the radiation due to antenna arrays is definitely a cause for concern, which has been addressed in the paper. A related work is discussed in [10]. The article on "*Cladding Modified Fiber Bragg Grating for Copper Ions Detection*" also deals with human health and proposes a novel sensor to detect heavy metals like copper in aqueous solutions. A useful contribution. A related work can be found in [11].

Congratulations to authors and happy reading! Great going SSID!

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