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## Editorial

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**Biographical notes:** Srikanta Patnaik is a Professor in the Department of Computer Science and Engineering, SOA University, Bhubaneswar, India. He has received his PhD in 1999. He has published around 100 technical papers in international journals and conference proceedings. He is author of two text books and edited 12 books and few invited book chapters. He is the Editors-in-Chief of *International Journal of Information and Communication Technology* and *International Journal of Computational Vision and Robotics* published from Inderscience Publishing House, England and also Editors-in-Chief of Book Series on "Modeling and Optimization in Science and Technology" published from Springer, Germany.

Satyanarayan Bhuyan received his PhD degree from the School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore, in 2010. He was a postdoctoral research fellow in the Department of Electrical and Computer Engineering, National University of Singapore (NUS) from 2010 to 2011. He was a scientist at the Institute for Infocomm Research, A\*STAR, Singapore, from 2011 to 2013. He is currently an Assistant Professor in the Department of Electronics and Instrumentation Engineering, ITER, Siksha 'O' Anusandhan University, Bhubaneswar, India. His present research interests include wireless energy transfer for piezoelectric devices, acoustic manipulations and wireless EV charging.

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In the era of smart electronics, smart materials and intelligent devices are in use in all most all fields of science, engineering and technology including medicine and space research. There has been an increased propensity to integrate smart materials with nano/micro technology to develop novel materials or structures for application in sensors, actuators, biomaterials, robotics, and structural health monitoring, etc. The combination of intelligent systems, materials, devices and nano/micro technology provides many

advantages, realises novel designs that could not be achieved in traditional engineering, and also offers greater opportunities. This issue covers articles from the contributors who are working in this area of cutting edge technology.

The first paper entitled 'Impact of dual material gate and lateral asymmetric channel in GS-DG-MOSFET' by S.K. Mohapatra et al. presented the potential benefits of dual material gate and lateral asymmetric channel on high-k gate stack double gate (GS-DG) metal oxide semiconductor field effect transistor (MOSFET). According to the investigators, the idea behind this investigation was to provide a physical explanation for the improved performance exhibited by different device design guidelines.

The second paper entitled 'Delay analysis of ultra high speed InAlAs/InGaAs high electron mobility transistor' by M. Mohapatra et al studied the DC, RF and delay analysis of InAlAs/InGaAs based high electron mobility transistor with different gate lengths, viz. 50 nm, 35 nm and 15 nm.

The third paper entitled 'Investigation on tensile behaviour of gongura fibre made hybrid polymer matrix composite' by J. Revanthkumar et al. presented the composites which are alternate materials to overcome the problem of conventional materials. The investigation was done on the development and characterisation of polymer composites made of natural fibre, with gongura as reinforcement and hybrid polymer as matrix as well as the influence of different parameters on tensile strength of composite.

The fourth paper entitled 'Microstructure simulation of Ti-6Al-4V biomaterial produced by electron beam additive manufacturing process' by S. Sahoo studied the microstructure simulation of Ti-based biomaterial. In this study, a phase field model is developed for microstructure evolution of Ti-6Al-4V biomaterials produced by EBAM process and the simulation results are compared with the analytical model and experimental findings by measuring the spacing evolution under the solidification condition was shown.

The next paper entitled 'Effect of Sb addition on optical properties change in  $As_{40}Se_{60}$  chalcogenide thin films' by R. Naik studied the effect of Sb addition on the optical properties of  $As_{40}Se_{60}$  chalcogenide thin film. The result shows that the optical band gap  $E_g$  decreases while the width of localised states (Urbach energy)  $E_c$  increases. The XPS core level spectra changes with the addition of Sb clearly interpret the optical properties change due to Sb addition.

The paper entitled 'Influence of atomic layer deposited coatings for MEMS applications: a review' by V.S. Sundram and S. Nesappan deals with a comprehensive review on the influence of coating MEMS devices using atomic layer deposition (ALD) to produce nanometer-thin films. It has recently become a subject of great interest for ultrathin film deposition in many various applications such as microelectronics, photovoltaic, dynamic random access memory (DRAM), and micro-electro-mechanical system (MEMS). Atomic layer deposition (ALD) is a thin film growth technique that utilises alternating, self-saturation chemical reactions between gaseous precursors to achieve deposited nano-scale layers.

The paper entitled 'Performance evaluation of multi-junction solar cell with a new InGaP tunnel junction' by P.P. Nayak et al. studied the performance study of multi-junction solar cell with a new InGaP tunnel junction.

The paper entitled 'Energy transfer to piezoelectric component through magnetic resonant coupling' by P.P. Nayak et al. presents the characteristics of piezoelectric component driven by electromechanical and magnetic resonance coupling based on energy transfer method. They have observed that the energy received by the piezoelectric

component depends on the operating frequency, coil design and distance between the coils. They have also provided the guidelines for designing an efficient wireless system to drive micro-nano piezoelectric devices for various potential applications.

The last but not the least paper entitled ‘Thickness dependent microstructure of ZnO films prepared by spin coating technique’ by I. Jena et al. studied the different layers of ZnO films, which is synthesised onto glass substrate by spin coating technique. The effect of different layers on the crystallinity and morphology of ZnO films have been investigated by the research team.

We are sure that the researchers in this domain will be immensely benefited from this special issue. We are thankful to all the authors who have contributed articles in this issue and are working in this domain and wish a great future in their academic endeavour.