

# Nanomaterials based low cost sensor design for applications in IoT

From 2<sup>nd</sup> April till 6<sup>th</sup> April 2018

## About the Workshop:

Interest in the field of Nanoscience and technology has led to a paradigm shift in sensor technology towards more sensitive recognition layers, low power, and reduced size and more so because of the known fact that silicon-based semiconducting metal oxide technologies will reach its scaling limit in the near future. In addition, silicon based electronics is based on rigid substrates that restricts its application in certain areas such as wearable electronics. Hence, a parallel field of research has gained momentum in the past few decades that deals with developing flexible substrate based electronics that can be used in numerous applications owing to versatility and pliability. Flexible Nano sensors can be easily integrated with modern electronic fabrication technologies for various applications in real life from healthcare to defence, from human computer interaction to imaging, futuristic technologies including the internet of things (IoT). This further demands amalgamation of novel sensing devices interfaced with the ultra-low power digital processing platform on the same miniaturized fabric. Keeping such requirement in mind, this workshop intends to provide an insight into the– flexible substrate based nano sensors, detection techniques, interfacing techniques, digital/ embedded system design and cover the aspects of device, Circuits and systems with several practical applications including IoT.

## Topics to be covered:

Introduction to flexible electronics, Fundamentals of sensor, Emergence of nano sensors, Sensor Materials- synthesis and properties, Sensor Design Process flow; Mixed Signal CMOS Sensing Interface Design, Self-sustainable Sensing Interface; Concepts and applications of digital signal processing systems design methodologies; Low power design technique, real time system implementation methodologies, digital and flexible electronics and its applications including IoT (Internet of Things) Applications of nano sensors, Hands on sessions on flexible substrate based nanosensors and demonstration.

## Organizing Committee:

Dr. Amit Acharyya, Associate Professor,  
Dept. of Electrical Engineering, IIT Hyderabad  
Dr. Sushmee Badhulika, Associate Professor,  
Dept. of Electrical Engineering, IIT Hyderabad

## Venue:

**For Key Note Lectures (Day 1 - 5)**  
Room No: 416, 114, 220, 101, 111 Academic Block-A  
**For Experimental Hands-on session (Day 1 - 5)**  
Research Labs at Kandi Shed and Academic Block-A 6th Floor,  
Indian Institute of Technology, Hyderabad,  
Kandi, Sangareddy Mandal,  
Medak-502285, Telangana, India.

## Speakers:



### Mr. Venkat Mattela, MD & CEO, RedPine Signals (USA)

Mr. Mattela has over 30 years of engineering and management experience in the semiconductor industry. Prior to joining Redpine, Mr. Mattela was at Network Media Platforms Group of Analog Devices as Director and was responsible for the product, strategy and business development for media wireless connectivity solutions (WLAN, WMAN)



### Dr. Srikanth Vadali, University of Hyderabad (Central University) Dr.-Ing. (Universität Siegen, Germany)

Research Interests: Nano Science and Technology, Surface and Interface Engineering, Synthesis, Characterization and Applications of Thin Films and Nano Materials, Non-Destructive Testing, Modeling and Simulation, Synthesis of Diamond, Si-C-B-N, and Nanocarbon Material Systems



### Dr. Sushmee Badhulika, IITH

Associate Professor at Dept of Electrical Engineering. Research Interests: Flexible & Wearable Nanoelectronics, Electrochemical Sensors, Paper Electronics



### Dr. Amit Acharyya, IITH

Associate Professor at Dept of Electrical Engineering. Research Interests: VLSI Signal processing, Healthcare Technology, Low Power VLSI



### Dr. Swati Ghosh Acharyya, University of Hyderabad.

Research Interests: Surface engineering for improving the corrosion and wear resistance of implant materials. Effect of LASER surface peening on the crack initiation behaviour of stainless steel and nickel base alloys, Studying the mechanism of stress and/or strain induced martensitic transformation in the surface layers of austenitic stainless steel as a result of surface working, Engineering the surface properties of stainless steel, carbon steel and nickel based alloys for improved corrosion resistance.



### Mr. Ramesh Reddy, Senior Scientist, RCI, Defence Research and Development Organization, Hyderabad

## Course Co-ordinator

**Dr. Amit Acharyya**

**Associate Professor,**

**Dept. of Electrical Engineering,**

**IIT Hyderabad**

Phone No. 040-2301 6106

Email: amit\_acharyya@iith.ac.in