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Nanotechnology & the internet-of-things

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Conventional device technologies usually employ top-down fabrication methodologies for high volume manufacturing. However, as we enter the nano-scale regime and the Internet of Things (IoT) era, there are many challenges faced by the conventional top down approaches owing to the variability&reliability issues. Some of these issues with respect to the conventional technologies can be better addressed by employing a host of bottom up approaches through innovative process integration strategies. Further, there is also a need for an intelligent integration of diverse technologies, materials and processes on the same die or in a package for realization of future smart systems for the IoT Era. This talk will present some of these integration methodologies where completely diverse platforms, materials and approaches are brought together in order to realize a targeted system functionality useful for the IoT applications.

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The generalized multi-dimensional platform for data array classification

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The author wants to pay an attention of many researches on the papers where new principles of description of random signals are formulated. The problem can be formulated as follows: *Is it possible to find a regression curve of many random signals if their probability distribution function (PDF) is not known?* This problem can be solved if we replace a priori supposition about PDF by some principles that can be tested and justified. All these new methods can be unified under acronym – NIMRAD- Non-Invasive Methods of the Reduced Analysis of Data. We should mark some basic references related to the NIMRAD in order to stress its applicability to a wide circle of problems that can be solved by new methods associated with quantitative description of random signals and sequences.

1. NAFASS – Non-orthogonal amplitude-frequency analysis of the smoothed signals.

2. The reduced fractal model (RFM) that can be applied for quantitative description of different blow-like signals.

3. Detection of quasi-periodic processes that are described in terms of Prony decomposition.

4. FERMA (The fractional exponential reduced moments' analysis) of random sequences that generalizes the conventional data description based on the total spectrum of the fractional moments.

5. The statistics of the fractional moments and definition of the complete correlation factor based on the generalized Pearson correlation function.

These new methods can be applicable for quantitative description of different signals that are registered in different nanotechnologies without a priori and specific modelsaccepted in the conventional quantum physics and mathematical statistics.

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