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Conference on Sensors, Circuits & Instrumentations Systems

Special Session

on

Functional Safety Applications

Organized by

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Call for Papers for Special Session

Since the fabrication of the first integrated circuit in 1958 by Jack Kilby, its complexity has been increased over the last decades to achieve multiple functionalities from compact and miniaturized devices. For example, the first Microprocessors Intel 4004 (1971) had 2,300 Transistors within an area of 12 mm², while the new versions of Intel processors have tens of millions of transistors per mm². Such integrated circuits are embedded in most of the daily used devices starting from washing machines, fridges, TV, cars, and planes. One of the essential systems that support the developments in future technology such as Industry 4.0 is the Cyber-Physical Systems (CPSs). CPSs are merging the physical and the virtual worlds not only in industrial applications but also in automotive, avionics, medical monitoring, smart homes, and robotics.

As a result of the compactness of integrated circuits, the random hardware failures increase. Systematic failures, which are mainly the human errors in hardware design, production or maintenance or software errors, are also increased. The occurrence of these failures reduces the availability of the system and increases the hazards of human death or injury, property loss or environmental disasters. To prevent or mitigate the hazards related to the malfunction of the **electrical, electronic and programmable electronic systems**, the concept of “Functional Safety” has been established by the International Electrotechnical Committee Advisory Committee of Safety (IEC ACOS) in 1980s. Based on this work, the IEC61508 standard has been born in 1997. This standard describes the life cycle of developing electrical, electronic and programmable electronic systems that are used in safety-critical systems. Various international

norms and standards have been developed to cover a variety of applications such as the process industry, robotics, automotive, and railway (IEC61511, IEC62061 ISO26262, etc.).

Topics of interest include, but are not limited to:

- Functional safety
- System on Chip for safety Related Applications
- Functional safety in Human-Robot Collaborations (HRC)
- Functional Safety in Automotive Applications
- Functional Safety in Medicine Applications
- Safety Software Architectures and Applications
- Safety Hardware Architectures and Applications