4-6 papers per special session (going through the same review process as regular papers)

Special Session 1: Testing-aware analog/RF, mixed-signal and digital integrated circuit design approaches
Session organizer: Dr. Marvin Onabajo (monabajo@ece.neu.edu)
Papers are solicited in the following topics of interest, but not limited to:
- Built-in self-test
- Design for test
- On-chip calibration
- Machine learning based optimizations
- Design automation
- Industry best practices

Special Session 2: Emerging materials, devices, circuits, and processing for beyond-CMOS nanoelectronics and heterogeneous integration
Session organizer: Dr. Huamin Li (huaminli@buffalo.edu)
Papers are solicited in the following topics of interest, but not limited to:
• Emerging low-dimensional materials such as carbon nanotube, transition metal dichalcogenides, and metal oxides.
• Novel spintronic, magnetic, optoelectronic materials and devices.
• Neuromorphic and memristive devices such as artificial synapses and neurons.
• Steep-slope devices such as phase change transistors, tunnel transistors, ferroelectric transistors, and cold source transistors.
• Quantum computing, in-memory computing, and in-sensor computing devices and circuits.
• Monolithic 3D integration and processing.

Special Session 3: New Design, Test and Packaging Solutions for Wide Bandgap Technologies
Session organizer: Dr. Tian Xia (txia@uvm.edu)
Wide bandgap (WBG) semiconductor technologies have advanced rapidly in recent years. Their advantages over conventional semiconductor materials like silicon and gallium arsenide include higher breakdown voltages, faster switching speeds, and superior thermal conductivity. These qualities make them well-suited for a wide range of applications, including high-frequency, high-power efficiency RF and microwave circuits & systems, power electronics, biomedical systems, and many more. However, design, testing and packaging of WBG circuits and systems present unique challenges. Many sophisticated factors must be carefully considered, such as high switching frequency, low leakage current, high operating voltage, high thermal density, etc. This technical session will aggregate studies from academia and industry on WBG technologies.

Special Session 4: Bioelectronics & Micro/Nano Devices w/ AI Integration
Session organizer: Dr. Umer Hassan (umer.hassan@rutgers.edu)
Papers are solicitated in the following areas including but not limited to,
- Bioelectronics
- Micro-nano sensing devices with emphasis on biomedical applications
- BioMEMS and biomedical technologies
- Impedance/ fluorescence/ absorbance spectroscopy for biomolecular detection applications
- Multimodal biosensing systems

- Micro/ Nano electronics for Biosensing and Bio-actuation
- AI/ ML integration with biodevices

Special Session 5: Power electronics and its applications
Session organizer: Dr. Prasanta K. Ghosh (pkghosh@syr.edu)
Papers are solicited in the general area of power electronics technology including application and design, analytical tools for efficient conversion and control of electric power. Some topics of interest are listed below, but not limited to:
- Power conversion topologies.
- Energy storage systems.
- Power electronic packaging.
- Electric vehicles and charging infrastructure.
- Application of digital twins, cloud design and simulation techniques.
- Energy conversion for communication systems.
- Wireless power transfer.

Special Session 6: Emerging Issues in Hardware and System Security
Session organizer: Dean Sullivan (Dean.Sullivan@unh.edu)
There has been a recent explosion of attacks targeting hardware and its supply chain. These threats repeatedly reveal that our current solutions are lacking and that despite decades of threat analysis, modeling, and prevention we face issues defending against creative adversaries. This special session seeks novel contributions in hardware and systems security that aim to expose emerging threats, investigate practical threat models, or automate analysis of black-box solutions. Topics of interest include, but are not limited to, the following areas:
- Side-channels and fault-injection attacks or their countermeasures
- Hardware security and privacy
- Cryptographic hardware
- Trusted execution environments
- Zero root-of-trust
- Formal methods
- Hardware fuzzing
- Security tools development
- Security-oriented hardware design
- CPS, Smart grid, and IoT device security
- AI/ML hardware
- Autonomous vehicle systems.