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Selected Topics in Intelligent Chips with Emerging Devices, Circuits and Systems

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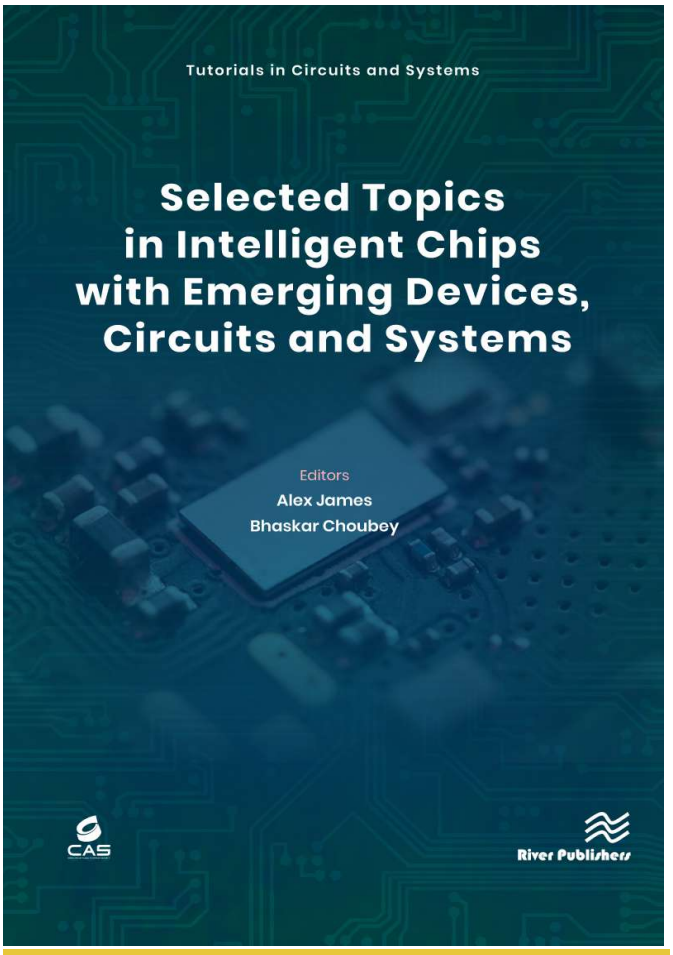
Memristors have provided a new direction of thinking for circuit designers to overcome the limits of scalability and for thinking of building systems beyond Moore's law. Over the last decade, there has been a significant number of innovations in using memristors for building neural networks through analog computing, in-memory computing, and stochastic computing approaches. The emergence of intelligent integrated circuits is inevitable for the future of integrated circuit applications.

This book provides a collection of talks conducted as part of the IEEE Seasonal School on Circuits and System, having a focus on Intelligence in Chip: Tomorrow of Integrated Circuits. Technical topics discussed in the book include:

- Edge of Chaos Theory Explains Complex Phenomena in Memristor Circuits
- Analog Memristive Computing
- Designing energy efficient neo-cortex system with on-device learning
- Integrated sensors
- Challenges and recent advances in NVM based Neuromorphic Computing ICs
- In-memory Computing (for deep learning)
- Deep learning with Spiking Neural Networks
- Computational Intelligence for Designing Integrated Circuits and Systems
- Neurochip Design, Modeling, and Applications



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