Patent Search

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Abstract:

As semiconductor with the progression of semiconductor technology, the demand for high-performance, low-power, and economical VLSI architectures is steadily inc study examines advanced VLSI architectures and design approaches specifically developed for next-generation digital applications, such as AI, IoT, 5G, and high-perfo computing (HPC). Significant breakthroughs encompass low-power design methodologies, AI-enhanced VLSI automation, multi-core processing, hardware accelerator GPUs, TPUs, and NPUs), and 3D-IC integration. Furthermore, novel paradigms such neuromorphic computing, processing-in-memory (PIM), and quantum-inspired cir being explored to improve efficiency and scalability. Security and dependability are ensured by post-quantum cryptography accelerators and self-repairing VLSI circuit improvements facilitate the development of next-generation AI-driven, energy-efficient, and high-speed computing systems, positioning VLSI as a crucial facilitator of technologies.

Complete Specification

Description:Summary of the work
The rapid advancement of Moore's Law over the course of the last few decades has been the driving force behind the miniaturization of transistors, which has enab them to achieve increased circuit density and improved performance. Conventional VLSI design approaches, on the other hand, need to be reevaluated in order to overcome restrictions such as power leakage, thermal difficulties, and manufacturing costs. This is important since physical feature sizes are becoming closer and c nanometre scales. Engineering Change Order (ECO) techniques, low-power design strategies, and chaos-based circuit implementations are some of the new approa that improve the adaptability and efficiency of very large scale integrated circuits (VLSI) designs.

An further factor that has contributed to the demand for specialised VLSI architectures is the growing demand for high-performance computing, artificial intelligenc 5G communication, Internet of Things (IoT), and multimedia processing. In order to maximise the amount of processing power while simultaneously reducing the a of energy that is consumed, neuromorphic computing models, application-specific integrated circuits (ASICs), and field-programmable gate arrays (FPGAs) are curre being developed. Additionally, the integration of chaotic systems in very large scale integrated circuits has opened up new paths in cryptography, secure communica and random number generation, which has resulted in an increase in the digital systems' level of security and unpredictability.
, Claims:Claim

Our research on Innovative VLSI Architectures and Methods for Advanced Applications in the Digital Era introduces significant improvements in high-performance, l

View Application Status