
A 167-processor 65 nm computational platform well suited for DSP, communication, and multimedia workloads contains 164 programmable processors with dynamic supply voltage and dynamic clock frequency circuits, 3 algorithm-specific processors, and 3 16 KB shared memories, all clocked by independent oscillators and connected by configurable long-distance-capable links.

A 26mW 6.4GFLOPS Multi-Core Stream Processor for Mobile Multimedia Applications, Y.-M. Tsao, C.-H. Sun, Y.-C. Lin, K.-H. Lok, C.-J. Hsu*, S.-Y. Chien, L.-G. Chen, National Taiwan University, Taiwan, *UMC, Taiwan

A 26mW 6.4GFLOPS multi-core stream processor for mobile applications is implemented in 90nm CMOS technology. A unified stream processing architecture with power-aware frequency scaling and adaptive task scheduling techniques are proposed to reduce the power consumption and increase the performance to achieve the performance of 200Mvertices/s and 400Mpixels/s in 3D graphic applications.

The Visual Attention Engine (VAE), an 80x60 digital Cellular Neural Network, rapidly extracts global features used as attentional cues to streamline detailed object recognition. A peak performance of 24GOPS is achieved by 120 processing elements (PE) shared by the cells. 2D Shift register based data transactions enable 93% PE utilization. Integrated within an object recognition SoC, the 4.5mm2 VAE running at 200MHz improves object recognition frame rate by 83% while consuming just 84mW.

A 100 GOPS In-vehicle Vision Processor for Pre-crash Safety Systems Based on a Ring Connected 128 4-Way VLIW Processing Elements, S. Kyo, S. Okazaki, T. Koga*, F. Hidano*, NEC Corporation, Japan, *NEC Electronics Corporation, Japan

A 100GOPS vision processor LSI (IMAPCAR) for in-vehicle image recognition which consumes less than 2 watts of power has been developed. 128 of 4-Way VLIW with MAC (multiply add accumulation) processor elements (PE) to which data are assigned efficiently by DMA companion scaling capability, has achieved high performance in low cost. Compared with a previous design, performance for major vision tasks has been improved by a factor of 2.5 while 50% of power is reduced.