An Overview of Selected Heterogeneous and Reconfigurable Architectures

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References:
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Abstract:
Node level heterogeneous architectures are gaining popularity because of their excellent performance exhibited in real world applications from various domains. The main advantages of these architectures are better price-performance and power performance ratios compared to traditional symmetric CPU architectures. This article presents an overview of most interesting node level heterogeneous architectures, focusing on some common architectures, such as the NVIDIA and the ATI graphics processing units, the Cell Broadband Engine Architecture, the ClearSpeed processor, the field programmable gate array accelerator solutions from Maxeler MaxNodes, the SGI systems (RASC), and the Convey Hybrid-Core Computer. The presentation encompasses hardware resources and available software development tools for each of the mentioned architectures with both qualitative and quantitative comparisons. Toward the conclusion, the authors express their viewpoint on the future of heterogeneous computing.

Keywords:
Reconfigurable Architectures, General Purpose GPU Computing, Heterogeneous Architectures, Data Flow Architectures