Low Power Scheduling For High-Level Synthesis

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Abstract—Low power design has become a critical factor in the technical and commercial success of modern hardware systems. High Level Synthesis (HLS) involves transforming a behavioral description into a structural RTL-level netlist through scheduling, allocation, and binding [1] [2].The aim of this paper is to discuss integrated low power methods within the scheduling process of the HLS performed in [3]. The goal is to minimize switching activity and utilize low-power modules while meeting performance constraints, ultimately achieving a balance between size, performance, and energy efficiency. The scheduler discussed is known as the Power Scheduler [1] which identifies mutually exclusive operation paths, analyzes their activity profiles, and partitions them using a compatibility graph and clique search algorithm. Each resulting partition has a controlled activation or deactivation mechanism meaning they can be switched off when not used.

Index Terms—high level synthesis, scheduling, dynamic and static power, clique search algorithm.

I. INTRODUCTION

This document is a model and instructions for LaTeX. Please observe the conference page limits.

II. RELATED WORK

III. FUNDAMENTALS

A. Conclusion

ACKNOWLEDGMENT

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REFERENCES

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REFERENCES

[1] A. Rettberg, "Low Power Driven High-Level Synthesis for Dedicated Architectures," Phd Thesis, University of Paderborn, Paderborn, North-Rhein Westphalia, December 2006.

[2] Daniel D. Gajski, Nikil D. Dutt, Allen C-H Wu, and Steve Y-L Lin. High-Level Synthesis. Kluwer Academic Publishers, Boston/Dordrecht/London, 1992.

[3] A. Rettberg and F. J. Rammig, "Integration of Energy Reduction into High-Level Synthesis by Partitioning," in IFIP International Federation for Information Processing, 2006, pp. 225-234.