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**Heuristics for Design Time Optimization of
System-on-Chip Memory Power
Consumption**

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Abstract

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1 Introduction

In the field of embedded systems design nowadays, power consumption becomes one of the most important design factors especially in the domain of Systems-on-Chip. One of the key issues to design power-efficient embedded system is the power consumed by memories and memory related components. Some researchers have claimed that large fraction of power is dissipated by memories rr rr. Thus, memory power optimization plays a significant role in the design of power-efficient embedded systems. One of the most effective and common approaches to reduce memory power consumption is the memory partitioning method which is proposed in several articles rr,rr [SER16].

The rationale of memory partitioning is to split one single large memory into several small memory instances which can be accessed individually. And according to the profiled memory access patterns, frequently accessed address ranges are grouped to smaller memory instances while seldom accessed address ranges are grouped to larger ones. Therefor, the memory power optimization can be achieved by the facts that smaller memory instances consume less power and the larger memory instances are seldom accessed.

1.1 Motivation

A Appendix

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B List of Figures

C List of Abbreviations

MPSoC Multiprocessor System-on-Chip

Bibliography

- [SER16] Manuel Strobel, Marcus Eggenberger, and Martin Radetzki. “Low power memory allocation and mapping for area-constrained systems-on-chips”. In: *EURASIP Journal on Embedded Systems* 2017.1 (2016), p. 2. ISSN: 1687-3963. DOI: "10.1186/s13639-016-0039-5". URL: <http://dx.doi.org/10.1186/s13639-016-0039-5>.
- [TB14] Andrew S. Tanenbaum and Herbert Bos. *Modern operating systems*. 4th edition. Upper Saddle River, New Jersey: Pearson Education, Inc., 2014. ISBN: ISBN-10: 0-13-359162-X.

Erklärung

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Das elektronische Exemplar stimmt mit allen eingereichten Exemplaren überein.

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Declaration

I hereby declare that the work presented in this thesis is entirely my own.

I did not use any other sources and references than the listed ones. I have marked all direct or indirect statements from other sources contained therein as quotations.

Neither this work nor significant parts of it were part of another examination procedure. I have not published this work in whole or in part before.

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