A Review of Caching Techniques for Low Power Consumption in Embedded Devices

Aniket Ashwin Samant
Delft University of Technology
Delft, The Netherlands
Email: A.A.Samant@student.tudelft.nl

Apoorva Arora
Delft University of Technology
Delft, The Netherlands
Email: A.Arora-1@student.tudelft.nl

Snehal Jauhri
Delft University of Technology
Delft, The Netherlands
Email: S.Jauhri@student.tudelft.nl

***Abstract*—Embedded systems that operate in the low-power domain need to be as efficient as possible in terms of their components' power consumption, including the onboard processor(s). Caches in processors, more specifically instruction caches, are known to be power-hungry since instructions are fetched frequently for the processor's operations. This paper reviews and compares some caching techniques for the instruction cache in order to reduce the power consumed by the cache thereby reducing the overall power consumption of the embedded processor.**

I. Introduction

- Introduce the topic and its relevance to computer architecture.
- State the Research Question.
- Briefly describe the to be detailed in the report Research Question solutions.
- State the main conclusions of your investigation.
- Present the report organisation (one paragraph).

II. Description of the Evaluated Solutions

One paragraph about what you will discuss in this section.

A. Solution 1

Describe the main idea of the solution in [1] and the way it works. Use your own words and in case really needed you can include figures from the original paper while giving proper reference. The text has to be self contained as the reader should be able to understand the essence of the proposed approach without reading the original paper.

B. Solution 2

Describe the main idea of the solution in [2] and the way it works. Use your own words and in case really needed you can include figures from the original paper while giving proper reference. The text has to be self contained as the reader should be able to understand the essence of the proposed approach without reading the original paper.

C. Solution 3

Describe the main idea of the solution in [3] and the way it works. Use your own words and in case really needed you can include figures from the original paper while giving proper reference. The text has to be self contained as the reader should be able to understand the essence of the proposed approach without reading the original paper.

D. Solution 4

Describe the main idea of the solution in [4] and the way it works. Use your own words and in case really needed you can include figures from the original paper while giving proper reference. The text has to be self contained as the reader should be able to understand the essence of the proposed approach without reading the original paper.

E. Solution 5

Describe the main idea of the solution in [5] and the way it works. Use your own words and in case really needed you can include figures from the original paper while giving proper reference. The text has to be self contained as the reader should be able to understand the essence of the proposed approach without reading the original paper.

III. Comparison

Discuss in a critical way the analysed solutions. For each of them highlight pros and cons. Provide a qualitative (and in case possible also a quantitative) comparison of the discussed approaches.

If applicable describe the way you would try to address the problem and explain why do you think your solution could give better results.

IV. Conclusions

Summarise the report content and draw the conclusions of your investigation.

Appendix A
Some Observations

- Do not use titles like "Reading Assignment Report - Group x". Give the report a meaningful title such that the reader can infer form it the essence of the discussed topic.
- Plagiarism rules are still in place despite the fact that the introduction of novel ideas is not the key issue. Do not make use of text from the papers under discussions or any other papers, reports, etc.
- More references can and should be included, if relevant, in the text.

REFERENCES

[1] Author1 and Author2, *Paper 1 title*, Full reference paper 1.
[2] Author1 and Author2, *Paper 2 title*, Full reference paper 2.
[3] Author1 and Author2, *Paper 3 title*, Full reference paper 3.
[4] Author1 and Author2, *Paper 4 title*, Full reference paper 4.
[5] Author1 and Author2, *Paper 5 title*, Full reference paper 5.