

Review of Bachelor's Thesis

Student: Alfageme Sainz Samuel
Title: Comparison of Parallel Programming APIs (id 19347)
Reviewer: Goldmann Tomáš, Ing., UITS FIT VUT

- 1. Assignment complexity** **average assignment**
Difficulty of the assignment is average.
- 2. Completeness of assignment requirements** **assignment fulfilled only partially**
The first four points of the assignment have been completed according to the specified requirements. Algorithms was implemented using all APIs/frameworks as requires. In the thesis there was remarked that speed up comparison has not been done, because no graphic card with CUDA support was available. But comparison between OpenCL and OpenMP API could have been evaluated, therefore fourth point focused on the experiments has not been fulfilled.
- 3. Length of technical report** **in usual extent**
The technical report fulfils the required limit for the bachelor thesis (ca 40 standardized pages).
- 4. Presentation level of technical report** **65 p. (D)**
The thesis is divided into 6 parts. Each part has a logical structure. My objections are related to the Chapter 5 which should be more extensive. The chapter contains only a comparison among parallel APIs by user friendliness aspects such as total time to make solution, extra lines of code of the port as taken from the reference sequential algorithm and number of failed versions before getting the right results. Metrics based on a number of failed versions before getting the right gains of the parallel implementations had been not mentioned for CUDA solution, since implementation with CUDA framework was not tested. Results of speed-up experiments with all parallel APIs solutions were not included in this chapter.
- 5. Formal aspects of technical report** **75 p. (C)**
Chapter 5 contain some minor misspellings and grammatical mistakes (it might have probably been finished in a hurry).
- 6. Literature usage** **80 p. (B)**
The list of used resources contains relevant entries properly covering the whole scope of the presented work. References to some images have not been specified.
- 7. Implementation results** **65 p. (D)**
All required implementations of the Gray-Coded Bit-Plane Matching (GCBPM) algorithm has been programmed. Source codes are clear and contain important comments. Scripts for testing were implemented, but results were not presented in the thesis.
- 8. Utilizability of results**
The results from this thesis are not meant to be used in practice, merely they would be a good information source about various approaches to the parallel programming and their speed-up possibilities, if the application was completely tested.
- 9. Questions for defence**
 - Which parallel toolkit is best for GC-BPM algorithm (in terms of the speed-up)?
 - Which parallel APIs/frameworks do you recommend for parallel programming, and why?
- 10. Total assessment** **49 p. failed (F)**
Overall, the thesis fulfils most of the requirements on bachelor thesis. In the theoretical sections student presented the GC-BPM algorithm and described important information about parallel programing. These parts are very good with some formal errors e.g. references to some images have not been specified. Sections with algorithm descriptions and implementations contain all required information. Some information about parallel APIs/frameworks in implementation section belongs to the theoretical section, but it does not have any decisive influence on final evaluation score. Nevertheless, experiments chapter is questionable part of the thesis. Student described difference between parallel APIs/frameworks by ease of use, this assessment is alright. The major part of the task however, was to perform a set of experiments with algorithms implemented using different APIs. These experiments, were supposed to determine the speed gains from the parallel implementation (computation). The results however, cannot be found in this chapter nor anywhere else in the thesis. On one hand, thesis has a good structure, contains all important information about required parallel APIs/frameworks, on the other hand, one major task is not completed, although student implemented GC-BPM algorithm in all required parallel APIs/frameworks. If student had stated speed-up charts, compared parallel solutions by speed gain and

tested CUDA solution, I would have proposed final result C. Since one part from tasks is not solved, I propose the final evaluation score **"F" - failed**.

In Brno 16. August 2016

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