

Review of Bachelor's Thesis

Student: Alfageme Sainz Samuel
Title: Comparison of Parallel Programming APIs (id 19037)
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 and second point of the assignment have been completed according to the specified requirements. The third point hasn't been completed, since the algorithm was not implemented using all the APIs/frameworks as required, which casts doubts on the fulfilment of points 4 and 5, since the experimental results presented in the report are not supported by any source code.
- 3. Length of technical report** **in usual extent**
The technical report fulfils the required limit for the bachelor thesis (ca 35 standardized pages).
- 4. Presentation level of technical report** **60 p. (D)**
The thesis is divided into 5 parts. Each part has a logical structure. My objections are related to the Chapter 3 and 4, which should present more detailed description of the implementation of the image stabilization algorithm using plain C, OpenCL, OpenMP and CUDA and corresponding experimental results. Speed-up chart for the OpenMP implementation presents measurements for one to twelve processing units, but the hardware used for testing consisted only of four processing cores. This situation isn't explained in the technical report. There is speed-up chart missing for OpenCL based implementation and measurement for simple sequential version (plain C) is not present either.
- 5. Formal aspects of technical report** **85 p. (B)**
The last two chapters contain some minor misspellings and grammatical mistakes. Formally is the theoretical introduction (Chapters 1 - 3) much better than the other parts of the report.
- 6. Literature usage** **75 p. (C)**
The list of used resources contains relevant entries properly covering the whole scope of the presented work. References to some images haven't been specified.
- 7. Implementation results** **20 p. (F)**
Provided source code doesn't contain all required implementations of the Gray-Coded Bit-Plane Matching (GC-BPM) algorithm (CUDA, OpenCL and OpenMP are missing on the attached CD, only the plain C implementation is available). Since the required source code is missing it is not possible to evaluate the implementation at all, which is a major failure.
- 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 were fully implemented, properly tested and compared.
- 9. Questions for defence**
 - Which parallel toolkit is best for GC-BPM algorithm (in terms of the speed-up)?
 - How much influence has the usage of pinned memory to performance?
- 10. Total assessment** **40 p. failed (F)**
Overall, the first part of the work is a good start of a bachelor thesis with a very good theoretical introduction, in which student presented the GC-BPM algorithm and described important information about parallel programming. However, the thesis is not complete and probably had been finished in a hurry. My objections are related to the implementation of the GC-BPM algorithm and presented experimental results. Parallel GC-BPM algorithm implementations are missing (all the parallel versions - CUDA, OpenCL and OpenMP), therefore student couldn't perform experiments and draw conclusion about speed gains. Hence, I propose the final evaluation score **"F"** - **failed**.

In Brno 3. June 2016

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