

## Dissertation assessment

Author: Bc. Jan Kůrka

Title of thesis: Optimization of admission of patients to a hospital by using parallel algorithms on Intel Xeon Phi  
Assessment written by: Ing. Libor Bukata

Diploma thesis of Jan Kůrka is dedicated to the parallel algorithms for the optimization of the patient admission to hospitals. The main goal was to adapt a state-of-the-art sequential algorithm for high-performance Intel Xeon Phi co-processors in order to accelerate computations.

In general, the text is readable and well structured. The first chapter briefly describes the problem and motivation for using parallel hardware. The next chapter deals with the mathematical model of the problem and notation. Afterwards, an entire chapter is devoted to Intel Xeon Phi accelerator, to be more particular, an architecture is sketched and a setup guide for Gentoo Linux is provided. The following three sections constitute the core of the work as the sequential and two parallel versions of optimization algorithms are proposed. The sequential version is a successful replication of Ceschia and Schaerf's algorithm. Jan Kůrka carried out many modifications to the original algorithm to make it more suitable for parallel hardware. The chapter with experimental results, however, reveals that although the number of evaluated assignments significantly increased by using many threads, the time to the same quality solution has been decreased only slightly since the author was unable to find appropriate parameters for the first version of the parallel algorithm and the second version was less effective in terms of the number of evaluations. Author compares the Intel Xeon Phi with Intel Xeon CPU and comes to a conclusion, which I also agree with, that Intel Xeon Phi is not suitable to solve this problem since the vectorization cannot be effectively utilized. Final chapter concludes the work and recapitulates the results.

The student regularly attended the meetings (once per week) to discuss how to deal with new problems and how to improve the algorithms. I appreciate the effort the student put into the implementation of the algorithms. Taking into consideration an excellent cooperation with the student and the thesis, which meets both the technical and formal requirements, I recommend the work for the defense and evaluate it by grade **B – very good**.

Date: 3.7.2016

*Libor Bukata*