Recommendation of the defense of Ph.D. thesis

Ph.D. candidate: Gabriela Nečasová advisor: Václav Šátek

The dissertation thesis of Gabriela Nečasová deals with "Parallel Numeric Solution of Differential Equations". The main aim of the thesis is to solve large systems of ordinary differential equations (ODEs), which comes from the second-order partial differential equations frequently occurring in the technical practice. The systems of ODEs are numerically solved in the parallel way using newly proposed and implemented higher order method based on Taylor series. Comparisons with the state-of-the-art Runge-Kutta solvers are done and the results overcome the commonly used Runge-Kutta methods in many cases.

Gabriela started her doctoral studies immediately after finishing the master study program in 2014. Her supervisor was doc. Kunovský. During the doctoral studies, she completed all required exams and successfully passed the state doctoral exam in 2016.

During her doctoral studies, Gabriela participated in several courses that are offered by our faculty. She led the laboratories and the lectures in the courses: High Performance Computations, Electronics for Information Technology and Introduction to Programming Systems.

She always worked to improve the image of the faculty, either by participating in the organization committee of Excel@FIT conference or by providing the support for GAUDEAMUS Fair.

I would like to commend Gabriela for her abroad cooperation and activities. Especially during her one-year Erasmus stay at Università della Svizzera italiana, Lugano, Switzerland where she obtained the practical experience with programming on supercomputers and as member of team in AKTION project during cooperation with Vienna University of Technology.

Gabriela has clearly proved her ability for creative work (both theoretical and practical). She worked on her thesis alone and the obtained results were presented on several prestigious conferences and journals.

The results were published in international journals, namely, Open Computer Science (2 publications) and Advances in Electrical and Electronic Engineering (1 publication).

Results were also published at international conferences, for example at International Conference on High Performance Computing & Simulation (HPCS), International Conference of Numerical Analysis and Applied Mathematics (ICNAAM), International Conference Informatics' (Informatics'), International Conference on Simulation and Modeling Methodologies (SIMULTECH). In total, 21 entries in Scopus database, some of them are also indexed in Web of Science database (12 entries), and Core database (4 entries).

Hence, due to all the facts presented above, I would like to **recommend the thesis for the defense** and to award the Ph.D. degree.

Brno, February 28th 2023

Ing. Václav Šátek, Ph.D