Recommendation of the defense of Ph.D. thesis

Ph.D. candidate: Petr Veigend

advisor: Václav Šátek

The dissertation thesis of Petr Veigend deals with “High Order Numerical Method in Modelling and Control Systems”. The main aim of the thesis is to solve systems of ordinary differential equations (ODEs), which comes from the technical practice. The focus is on such systems which could be solved and controlled in real-time context. The linear and non-linear systems of ODEs are numerically solved 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 standardly used Runge-Kutta methods in many cases.

Petr started his doctoral studies immediately after finishing the master study program 2014. His supervisor was Doc. Kunovsky. During the doctoral studies, he completed all required exams and successfully passed the state doctoral exam in 2016.

During his doctoral studies, Petr participated in many courses that are offered by our faculty. He led the laboratories and the lectures in the courses: High Performance Computations, Electronics for Information Technology, Introduction to Programming Systems, Practical Aspects of Software Design and Fundamentals of Artificial Intelligence. He was also supervisor of three successful bachelor’s theses and one successful diploma thesis.

His cooperation and communication with students of our faculty was always assessed with good feedback, so from 2018 Petr became a Study Advisor and member of several committees at our faculty (e.g. Dean’s Collegium, Bachelor Study Programme Board, Council for the Use of Information Technologies and Equipment at FIT BUT).

He has always worked to improve the image of the faculty, either by participating in the organization committee of Excel@FIT conference since its inception or by participating in the GAUDEAMUS Fair.

I would like to commend Petr for his abroad cooperation and activities. Especially as member of team in AKTION project during cooperation with Vienna University of Technology.

Petr has clearly proved his ability for creative work (both theoretical and practical). He worked on his thesis alone and the obtained results were presented on several prestigious conferences and journals. The journals include Open Computer Science (2 publications) and Advances in Electrical and Electronic Engineering (1 publication). Some notable conferences include 2016 International Conference on High Performance Computing & Simulation (HPCS 2016), Vienna Conference on Mathematical Modelling (MATHMOD VIENNA 2015 and 2018) and several International Conferences of Numerical Analysis and Applied Mathematics (ICNAAM).

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, May 31st 2023 Ing. Václav Šátek, Ph.D.