MUNI

Habilitation Board Decision on the Nomination for Appointment to Associate Professor

Masaryk University	
Faculty	Faculty of Informatics
Procedure field	Informatics
Applicant	RNDr. Jiří Filipovič, Ph.D.
Applicant's home unit, institution	Institute of Computer Science, Masaryk University
Habilitation thesis	Software Performance Optimization in Scientific Computing
Board members	
Chair	prof. Ing. Pavel Zezula, CSc.
	Faculty of Informatics, Masaryk University
Members	prof. RNDr. Ivana Černá, CSc.
	Faculty of Informatics, Masaryk University
	doc. Ing. Jiří Jaroš, Ph.D.
	FIT VUT
	doc. Ing. Zdeněk Vašíček, Ph.D.
	FIT VUT
	prof. Nicola Bombieri
	University of Verona

Evaluation of the applicant's scholarly/artistic qualifications

The primary objective of Jiri Filipovic scientific activities was the development of methods to improve performance of scientific software by means of GPUs. His research in the field has already started during doctoral studies and continued during his postdoc both at FI MU and the University of Vienna, where he has spent 3 months. Later, he has also concentrated on autotuning CUDA and OpenCL kernels. This activity has opened a new research area, which analyses the code according to hardware performance counters.

In order to verify scientific results, he cooperated with many Czech as well as foreign institutions, some of them outside the computer science domain, and the common results were published in the corresponding scientific platforms. As a result, he published 48 papers, 23 of which in journals with an impact factor. At the time of the thesis submission, the applicant reports 331 citations to his works and the h-index 16 (February 2024 in Scholar google). In the last years of his professional career, the number of citations to his co-authored papers is strictly increasing. He acted as an organizing or program committee member for seven scientific events in the field and provided reviews for scientific journals and university grant agencies. His research results have received in 2012 the Joseph Fourier Award and in 2021 the applicant received the "MUNI Scientist" award for outstanding research results. On the other hand, the applicant's submission does not report membership in any scientific bord or panel, he has never received a project grant in a position of principal or co-principal investigator.

Conclusion: The applicant's scholarly/artistic capabilities **meet** the requirements expected of applicants participating in a habilitation appointment procedure in the field of Informatics.

Evaluation of the applicant's pedagogical experience

Since 2009 the applicant has been the primary presenter of the course GPU Programming at FI MU consisting of 50% theory and 50% case study and applications. He is also partially involved in Supercomputing architecture (two lectures per semester), Intensive computation (two lectures per semester), and Digitalni svet (one lecture per semester) courses at MU. Two lectures per semester he is delivering at the University of Vienna in the course High performance computing. Besides lectures in courses, he was also involved in classes and seminars both at FI MU and the University of Vienna. The commission considers the teaching load of the candidate near the minimum recommended by the Faculty of Informatics submission rules. The applicant supervised 15 bachelor and 9 master successfully defended thesis and his activity in the field continues. He was also acting as consultant of three doctoral candidates, one of them has successfully finished and the student's results as well as the professional afford of his consultant (Jiri Filipovic) and supervisor (prof. Matyska) were in 2023 awarded by the Masaryk University vice-rector's price.

Conclusion: The applicant's pedagogical capabilities **meet** the requirements expected of applicants participating in a habilitation appointment procedure in the field of Informatics.

Habilitation thesis evaluation

Evaluation of the habilitation thesis was prepared by three external evaluators who also expressed numerous questions for the defence.

Associate Professor Milan Ceska from the Faculty of Information Technology, Brno University of Technology, reported that the topic of the habilitation is important and is growing in relevance as computational demands of many important applications exceed the capacities of available hardware architectures. However, he considerers the exposition of results minimalistic and the related work practically missing. He

would also appreciate better explanation of the paper selection and comments on their quality. His final opinion is that the thesis fulfils the standard requirements on habilitation theses in the field of computer science.

Prof. Anton Wijs from the Faculty of Mathematics and Computer Science, Eindhoven University of Technology considers the thesis as an impressive body of work on the topic of Software Performance Optimization. He appreciates the applicant's role of the principal investigator and the first author in many of the coauthored papers. On the other hand, the reviewer is missing better connections between individual chapters and discussions about how the methods in the various chapters relate to each other and what is the vision of the applicant for the future. However, he concludes that the habilitation thesis fulfils requirements expected in the field of Computer Science.

Associate Professor Richard Vuduc, School of Computational Science and Engineering, Georgia Institute of Technology, appreciates the wide range of contributions, some with immediate practical impact, some concerning on important class of modern machines (GPUs), and others that try to use those experiences to derive general lessons into tools that can be applied more broadly. This variety demonstrates the versality and flexibility of the author's research program, which is nevertheless coherently focused on performance engineering for scientific simulations. He also compares the applicant's performance with two recent young but highly recognized scholars in the USA and concludes that considering the overall citation counts and h-index, the indicators are similar thus the thesis fulfils requirements expected of a habilitation thesis in the field of Computer Science.

Conclusion: The applicant's habilitation thesis **meets** the requirements expected of habilitation theses in the field of Informatics.

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Secret vote results

Voting took place: electronically

Number of board members		5
Number of votes cast		4
of which	in favour	4
	against	0

Board decision

Based on the outcome of the secret vote and following an evaluation of the applicant's scholarly or artistic qualifications, pedagogical experience and habilitation thesis, the board hereby submits a proposal to the Scientific Board of the Faculty of Informatics of Masaryk University to **appoint the applicant associate professor** of Informatics.

In Brno on 02.05.2024

prof. Ing. Pavel Zezula, CSc.   ....