MUNI

Annex No. 13 to the MU Directive on Habilitation Procedures and Professor Appointment Procedures

HABILITATION BOARD DECISION ON THE NOMINATION FOR APPOINTMENT TO ASSOCIATE PROFESSOR

Masaryk University

Faculty	Faculty of Informatics
Procedure field	Informatics
Applicant	**RNDr. Vojtěch Řehák, Ph.D.**
Applicant's home unit, institution	Fakulta informatiky MU
Habilitation thesis	Stochastic Real-Time Systems: Parameter Synthesis and Games

Board members

Chair	**prof. RNDr. Petr Hliněný, Ph.D**.
	Fakulta informatiky, MU
Members	**Prof. Krishnendu Chatterjee**
	Institute of Science and Technology (IST Austria), Austria
	doc. RNDr. Pavel Matula, Ph.D.
	Fakulta informatiky, MU
	prof. Ing. Michal Pěchouček, M.Sc., Dr.
	Fakulta elektrotechnická, ČVUT v Praze
	doc. Mgr. Adam Rogalewicz, Ph.D.
	Fakulta informačních technologií, VUT v Brně

Evaluation of the applicant's scholarly/artistic qualifications

When evaluating the applicant's scientific qualifications, the Board based its decision on the submitted materials, in particular, on the list of publications and CV of the applicant. It follows from these materials that the applicant has published his results mainly in refereed proceedings of established international conferences in CS - altogether 26 such papers, in 4 papers in impacted journals, and in 5 other proceedings papers. The topics of applicant's papers range from modelling and analysis of infinite-state systems, through network routing and analysis of communication protocols, till most recent stochastic real-time systems and patrolling games. There are also 2 results of type software.

In computer science, top-ranked conferences are more competitive than journals, and high-impact contributions appear in such conferences.

We would especially like to stress that 8 of the applicant's conference papers are in conferences of CORE-rank A ("top quality") and 3 of the papers (from years 2014-18) in conferences of CORE-rank A* ("exceptional quality"), namely in AAMAS and IJCAI. This is a clear indication that V. Řehák is able to conduct research at the highest international level. His results have got altogether 75 non-self citations in WoS, and the h-index is 5 in WoS. The applicant also lists, in the submitted materials, 99

non-self citations to his papers from the SCOPUS database. Google Scholar records 402 citations to his works (including self) and h-index 11.

V. Řehák was the principal investigator of one GAČR postdoc grant and a co-investigator of another one. He has participated in 7 other GAČR research grants as a team member, and also in the Center of excellence ITI and in two FP5 and FP6 projects. He was in the organizing team of EATCS Young Researchers School in 2014 and in the PC of the ECAI conference in 2016. His international collaboration and experience include long-term research stays at Aarhus University in Denmark and at Stuttgart University in Germany during his doctoral study, past collaboration with INRIA Rennes and current collaboration with TU Dresden in Germany (Prof. Christel Baier). He is refereeing papers for many international conferences and journals in CS.

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

Evaluation of the applicant's pedagogical experience

The applicant received his Ph.D. in Computer science in 2007. Already since 2005 he has been employed as a Research assistant at FI MU, and since 2013 he holds the Assistant professor position there.

The applicant has been teaching lectures of the course IV111 Probability in Computer Science for 7 semesters since 2013. He regularly participates in teaching lectures of the courses IA169 and PA160 (1 and 2 lectures in a semester). He has also been teaching tutorials of various courses in formal languages, automata, and algorithms. Since 2010 (for 17 semesters) he has been teaching doctoral course DTEDI Preparation of thesis proposal. He has done an excellent job in reorganization of the course IB002 Algorithms and data structures, in which he prepared the new tutorials and the supplementary e-learning questions.

The applicant is regularly evaluated by the students in anonymous surveys as an excellent teacher. Especially, they highly value his ability to clearly and simply explain even difficult concepts and his fair dealing with the students. They also mention his enthusiasm for teaching and the effort to learn as much as possible.

According to the submitted materials, the applicant has supervised 12 Bachelor's theses and 14 Master's theses, all successfully defended. 2 Bachelor's and 1 Master's theses are in progress. These numbers are quite high for theoretical computer science where it is more demanding to attract and train students than in application domains. He has also been a consultant of the doctoral student L. Korenčiak, who defended in 2018. Besides pedagogical work at the university level, the applicant also taught popular scientific lectures at the High school of Kpt. Jaroš during 2009/10.

The Board has also evaluated applicant's public lecture which took place on April 23, 2019 at FI MU (cf. a separate report). The lecture demonstrated applicant's technical and presentation skills.

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

Habilitation thesis evaluation

The applicant has submitted Habilitation thesis entitled **Stochastic real-time systems: Parameter synthesis and games**. The thesis consists of 28 pages of original introduction and commentary text, 15

pages of extensive bibliography, and 140 pages containing 11 reprinted conference papers from the years 2010–2017 (often in very condensed proceedings format). All these included papers are co-authored by groups of authors including the applicant, and the thesis specifies the applicant's substantial contribution to each of them. The author groups are mostly local, but 4 of the papers include foreign co-authors. The applicant is nearly always the last author due to the alphabetical ordering commonly used in the area.

The Board has selected and invited the following three reviewers of the Habilitation thesis:
- Prof. Patricia Bouyer-Decitre, LSV, CNRS & ENS de Cachan, France
- Prof. Marta Zofia Kwiatkowska, University of Oxford, UK
- Prof. Kim G. Larsen, Aalborg University, Denmark

All of them are top international experts in the areas covered by the thesis, and all the three reports from them are very positive. The Board would especially like to highlight the following parts of the reviews:

- Prof. Patricia Bouyer-Decitre: *The contributions of Vojtěch Řehák presented in this thesis cover a large spectrum, from inspiring fundamental results on stochastic real-time systems to practical algorithms and implementations. In this research topics, proofs have to be made in a very careful manner, as witnessed by some mistakes found in the earlier literature, and those proofs are always very technical and require strong mathematical skills and rigor.*

- Prof. Marta Zofia Kwiatkowska: *The results contain a blend of foundational research, notably novel problem formulations, together with algorithmic contributions and their complexity analysis, and finally also software tool implementation. The results are highly original and non-trivial, and are of major importance for rigorous specification and design of computerised systems. Importantly, they have already been taken up and/or significantly influenced the field of study, as indicated by citations and mention in survey and handbook chapters, and have opened up a number of new avenues for future work.*

- Prof. Kim G. Larsen: *In conclusion, I find the research addressed in the Habilitation of Vojtěch Řehák to be of very high quality, providing highly original and elegant solutions to a several important and non trivial problems. I also, appreciate the significant effort that has been made towards integration into tools (e.g. PRISM) and experimental evaluation of the developed algorithms.*

The board has come to the conclusion that the submitted thesis contains a wealth of excellent results. The results are on a very important topic of stochastic times systems. They cover a broad spectrum, starting from fundamental theoretical results, to new algorithmic solutions, to practical aspects such as implementations in software tools. In terms of techniques the results are highly non-trivial, require deep mathematical insights, and have been carried out with great care and rigor.

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

Secret ballot results

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

invalid │ 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

| x | appoint the applicant associate professor of Informatics.

| | terminate the procedure.

Date: April 23, 2019

Petr Hliněný   ………………………
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Krishnendu Chatterjee   ………………………
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Pavel Matula   ………………………
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Michal Pěchouček   ………………………
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Adam Rogalewicz   ………………………
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