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Annex No. 11 to the MU Directive on Habilitation Procedures and Professor Appointment Procedures

PUBLIC LECTURE EVALUATION

Masaryk University

Faculty	Faculty of Informatics
Procedure field	Informatics
Applicant	doc. RNDr. Jan Strejček, Ph.D.
Lecture date	15. 3. 2022
Lecture topic	Binary decision diagrams for deciding satisfiability of bitvector formulae and DQBF
Persons present (number)	68 (see attached list of attendees)
Designated evaluators (board members)	prof. RNDr. Petr Hliněný, Ph.D.
	Prof. Dr. Armin Biere
	prof. RNDr. Radim Bělohlávek, DSc.
	Prof. RNDr. Václav Matyáš, M.Sc., Ph.D.
	Prof. Jiří Srba, Ph.D.

Applicant's public lecture followed the abstract from the public announcement: "Many efficient methods and tools for analysis or synthesis of computer systems rely on satisfiability solvers for formulae of bit-vector theory. We explain the basics of this theory and sketch some applications of the corresponding satisfiability solvers. Then the concept of binary decision diagrams (BDDs) was recalled and the candidate explained how BDDs can be used to decide satisfiability of bitvector formulae. Further, we present some techniques that improve the performance of our BDD-based satisfiability solver Q3B. Finally, we briefly present another BDD-based solver DQBDD, which can solve satisfiability of quantified Boolean formulas with explicit dependencies (DQBF)."

The lecture topic is relevant and timely, the presenter contributed with numerous improvements to the application of BDD technology to satisfiability checking of bit-vector theory. The contributions were clearly presented and the key results were highlighted and documented by a successful development of the tool Q3B which won the relevant category of the quantified bit-vector track of the SMT-competition in 2016 and 2017.

The lecture was given in good English and demonstrated the applicant's very good technical and presentation skills, and also his deep understanding of the presented area. The lecture started with a nice top-down summary of the matter, and continued by recapitulating the necessary technical concepts - mainlyBDDs, which was easily accessible to non-experts. Then it outlined the actual application of BDDs to (practical) solving the problem of satisfiability of bit-vector formulae, and demonstrated the obtained results. Although many details were skipped in the presentation, Jan Strejček was able to clearly illustrate the main steps on nice and understandable examples.

At the end, the applicant answered several questions from the audience. Answers to most of the questions were convincing and at a high scientific level as expected for such a presentation.

Conclusion

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The lecture delivered by Jan Strejček, entitled *Binary decision diagrams for deciding satisfiability of bitvector formulae and DQBF* and delivered as part of the professor appointment procedure, **demonstrated** ~~failed to demonstrate~~ sufficient scholarly qualifications and pedagogical capabilities expected of applicants participating in a professor appointment procedure in the field of Informatics.

Date: 16.3.2022

Petr Hliněný