

HODNOCENÍ PŘEDNÁŠKY PRO ODBORNOU VEŘEJNOST

Masarykova univerzita	
Fakulta	Fakulta informatiky
Obor řízení	Informatika
Uchazeč	RNDr. Petr Novotný, Ph.D.
Datum přednášky	11. 4. 2023
Téma přednášky	Static Analysis of Termination and Safety Properties in Probabilistic Programs
Přítomno posluchačů (počet)	35
Pověření hodnotitelé (členové komise)	prof. RNDr. Petr Hliněný, Ph.D. prof. RNDr. Petr Jančar, CSc. doc. Mgr. Adam Rogalewicz, Ph.D.

Applicant's public lecture presented the problem of termination of computer programs, starting from the more classical deterministic setting, to the probabilistic setting of almost-sure termination of probabilistic programs. In this direction he introduced the audience to the notion of martingales which are crucial for the latter task. Subsequently, he showed several applications of the concept for proving termination and safety of probabilistic programmes with different types of termination arguments, including his own works. In particular, he focused on affine functions and lexico-graphic orderings over affine expressions. He supplemented the achieved results with an outlook on the future work: firstly, applications in proving differential properties, an area recently recognized as very important in the area of security; secondly, the long-term vision of capturing processes in deep learning, an area where such fundamentals are dramatically lacking.

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. There were numerous nice examples targeting the general audience given in the lecture and plenty of visualizations easing the understanding. The historical excursus allowed the audience to understand the presented methods as analogues of the non-probabilistic case. Altogether, the pedagogical level of the lecture was extremely high.

At the end, the applicant answered several questions from the audience. The answers showed that Petr Novotný has a wide overview of the presented topic as expected for such a presentation.

Závěr

Přednáška Petra Novotného „Static Analysis of Termination and Safety Properties in Probabilistic Programs“, přednesená v rámci habilitačního řízení **prokázala** dostatečnou vědeckou kvalifikaci a pedagogickou způsobilost uchazeče, standardně požadovanou v rámci habilitačních řízení v oboru Informatika.

Conclusion

The lecture delivered by Petr Novotný entitled „Static Analysis of Termination and Safety Properties in Probabilistic Programs“ **demonstrated** sufficient scholarly qualifications and pedagogical capabilities expected of applicants participating in a habilitation procedure in the field of Informatics.

Brno dne 11. 4. 2023

Petr Hliněný

Petr Jančar

Adam Rogalewicz

