

ACM Student Project of the Year 2013 Competition

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The Czech ACM Chapter & Slovakia ACM Chapter Student Project of the Year (ACM SPY) Competition is a competition seeking for the best master thesis in the field of informatics and information technologies. The ACM SPY 2013 was organized under auspices of the Ministry of Education, Youth and Sports, Czech Republic.

The ACM SPY competition represents a partnership of universities and industry with aim to advance excellence in education by supporting students in their theses projects. Profinet company and its partners (Microsoft, Canon, Ekonom) take care of organization, publicity and awards, and universities are responsible for motivating faculty (particularly through supervisors) to submit best theses to the competition and guarantee the whole evaluation process. Association for Computing Machinery (ACM), the world's largest educational and scientific computing society, guarantees the quality of the competition.

The ACM SPY competition has been organized now for fourth year. It was built on previous experience with ACM Student Research Competition organized by the Czech ACM Chapter in years 2004–2009 — a local version of a corresponding competition organized by ACM in USA, where students compete within the frame of ACM Research Conferences — and Diploma Thesis Competition organized by Profinet company in 2008–2009. The ACM SPY competition started in format similar to ACM Student Research Competition — students submitted their theses and a board of judges evaluated the theses in several rounds starting with a selection of the best theses published in the ACM SPY Gallery through the selection of the best of best theses which advanced to the Finals, and finally ending up with the ACM SPY first place winner.

The first two selections were done by the Czech and Slovak universities. Each faculty of university could submit up to 10 best master theses, but no more than 10 % of IT masters theses defended in the faculty in academic year 2012/2013. The faculty also selected the best one of these best theses. Next, the board of ACM SPY judges consisting of university professors evaluated

the best of best theses submitted by the universities. Evaluation criteria were (in order of priority):

- research aspect
- experimentation aspect
- realization aspect
- state of the art retrieval aspect

ACM SPY 2013 received best theses from 16 faculties of the following 14 Slovak and Czech universities:

- Brno University of Technology
- Charles University in Prague
- Comenius University in Bratislava
- Czech Technical University in Prague
- Masaryk University in Brno
- Mendel University in Brno
- Pavol Jozef Šafárik University in Košice
- Slovak University of Technology in Bratislava
- Technical University of Košice
- University of Economics in Prague
- University of Matej Bel in Banská Bystrica
- University of West Bohemia in Pilsen
- University of Žilina
- VŠB-Technical University of Ostrava

The these were selected from more than 2 000 IT master theses successfully defended at participating faculties. Each author of best submitted thesis created a poster presenting the key concepts of his/her research. The posters together with all the best theses selected by universities are published in the ACM SPY Gallery now (www.acm-spy.sk, www.acm-spy.cz).

The ACM SPY 2013 Finals was held on November 27, 2013 in Prague (hosted by Czech Technical University in Prague). All finalists presentations were of high quality. Participation in the Finals was a proof of professional level of contestants and their home universities. The first place winner was Josef Kokeš with his cryptanalysis of Baby Rijndael cipher was selected based on the submission and presentation by ten judges (three representing industry and seven representing universities).

We give below a list of winners of the Finals together with short description of their work. The theses were from various fields,

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such as cryptanalysis, information retrieval, computer vision, information systems, software engineering and computer networks. Some of the thesis resulted in scientific papers that are or going to be published. Some of the references are presented.

The first place winner, *Josef Kokeš* (supervised by Róbert Lórencz, Faculty of Information Technology, Czech Technical University in Prague) shows in his thesis “Cryptanalysis of Baby Rijndael Cipher” that Baby Rijndael cipher is a good approximation of Rijndael cipher, performs linear cryptanalysis and extends the results to the full Rijndael cipher. Weaknesses found in lighter Baby Rijndael Cipher may lead to break the full Rijndael cipher.

Second place winner, *Lukáš Kekely* (supervised by Jan Kořenek, Faculty of Information Technology, Brno University of Technology) designed a software controlled hardware acceleration system for high-speed networks in his thesis “Hardware Acceleration of Network Security and Monitoring Applications”. It uses FPGA card for high-speed processing of 100 Gbps networks. The thesis resulted in a publication [1].

Third place winner, *Martin Líška* (supervised by Petr Sojka, Faculty of Informatics, Masaryk University, Brno) describes a problem of searching in mathematical formulae in his thesis “Evaluation of Mathematics Retrieval”. The work deals with a system for mathematics retrieval and its evaluation. The thesis resulted in several publications. Evaluation results in a competition in Tokyo are described in [2].

Fourth place winner, *Ján Súkeník* (supervised by Peter Lacko, Faculty of Informatics and Information Technologies, Slovak University of Technology, Bratislava) focuses on avoiding errors in source codes caused by duplicated code in his thesis “Source Code Analysis using Abstract Syntax Trees”. The thesis resulted in a publication [4].

Fifth place winner, *Karel Lenc* (supervised by Jiří Matas, Faculty of Electrical Engineering, Czech Technical University in Prague) described a new benchmark for computer vision and new contribution to open-source project VLBenchmarks in his thesis “Evaluation and Improvements of Image Interest Regions Detectors and Descriptors”.

The following works took sixth-to-ninth place (in lexicographic order). *Peter Kostolányi* (supervised by Branislav Rován, Faculty of Mathematics, Physics and Informatics, Comenius University in Bratislava) focuses on finite automata with balanced use of resources and theory of equiloading of some in his thesis “Balanced Use of Resources in Computations”.

Michal Krnáč (supervised by Jarmila Škrinárová, Faculty of Natural Sciences, University of Matej Bel, Banská Bystrica) deals with efficient use of grid systems in his thesis “Algorithms of Load Balancing in Grid Environment”.

Jakub Stonawski (supervised by Petr Šaloun, Faculty of Electrical Engineering and Computer Science, VŠB-Technical University of Ostrava) focuses on proposing new links in social networks based on face recognition in his thesis “Another Links in Social Networks using Face Recognition”. The thesis resulted in several publications in proceedings of international conferences, e.g. [3].

Otakar Trunda (supervised by Roman Barták, Faculty of Mathematics and Physics, Charles University in Prague) investigates possible ways to use the Monte Carlo Tree Search in the field of planning and scheduling in his thesis “Monte Carlo Techniques in Planning”. The thesis resulted in several publications in proceedings of international conferences, e.g. [5].

We hope this information will further encourage students from Slovak and Czech universities to work hard in their research to achieve excellent results in their master theses to be selected for the next year of the ACM SPY competition. We also hope the results of ACM SPY 2013 Finalist will be interesting to a wider community.

References

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