

Preface to Special Section on the ACM Student Project of the Year 2012 Competition

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This Special Section brings a collection of extended abstracts of the best students' research projects within the area of informatics and information technologies submitted to the Czech ACM Chapter & Slovakia ACM Chapter Student Project of the Year (ACM SPY) Competition. ACM SPY is a competition seeking for the best master thesis in the field of informatics and information technologies.

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. Profinnit company and its partners take care of organization 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.

The ACM SPY competition has been organized now for third year. It was built on previous experience with ACM Student Research Competition organized by the Czech ACM Chapter from 2004 to 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 Profinnit company in 2008 and 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.

This year we moved responsibility for the first and second round selection to the Czech and Slovak universities. They could submit up to 10 best master theses (no more than 10 % of graduates) together with selecting the best 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 2012 received best theses from 13 Slovak and Czech universities. They were selected from 1 513 successfully defended master theses. Each author of best submitted thesis prepared a poster presenting key concepts of his/her research. Posters together with all the theses by best students selected by universities are published in the ACM SPY Gallery now (www.acm-spy.sk, www.acm-spy.cz).

The ACM SPY 2012 Finals held on October 25, 2012 in Prague (hosted by Czech Technical University). 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 Ondrej Mikšík with his novel approach to dynamic scene understanding was selected based on the submission and presentation by six judges (half and half representing industry and universities).

This Special Section contains extended abstracts of research works of eight ACM SPY 2012 finalists. Reader will find here papers from various fields, such as computer vision, computer graphics, information systems, artificial intelligence, software engineering and computer networks. The papers appear sorted by name of the author. Let us present here the key ideas of ACM SPY 2012 winning master theses.

The first place winner, *Ondrej Mikšík* (supervised by Luděk Žalud, Brno University of Technology) discusses in his paper two approaches to semantic scene understanding of dynamic environments, which can be applied to several scenarios such as navigation of mobile robots or semantic mapping.

Second place winner *Tomáš Kovačovský* (supervised by Ján Žižka, Comenius University in Bratislava) devised a novel approach for fast high dynamic range scanning for 3D scanning system. For experimental evaluation he built the stand-alone 3D scanner SMISS based on a fringe pattern structured light projection for automatic 3D reconstruction in metric space.

Third place winner, *Tomáš Borovička* (supervised by Pavel Kordík, Czech Technical University in Prague) focused on classification model, in particular on training set construction methods. He proposed novel approach on how to select data samples from an original set and place them into the training and testing sets.

Tomáš Staník proposed novel method for the approximate positioning inside buildings. *Ivan Srba* focused on group formation problem in collaborative learning environment. *Vojtech Salajka* dealt with evolutionary design of a special type of image filters – polymorphic image filters. *Petr Kellnhöfer* described a solution for the fully automatic registration and multimorphing of surface triangular meshes. *Petr Lukáš* dealt with design and implementation of a processor of the XQuery computer language used for searching data in tree organized XML documents and databases.

We hope this special section will further encourage students from Slovak and Czech universities 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 2012 Finalist will be interesting to a wider community.