

Preface to Special Section on Student Research in Informatics and Information Technologies

Mária Bieliková

Faculty of Informatics and Information Technologies, Slovak University of Technology, Ilkovičova, 842 16 Bratislava, Slovakia
bielik@fiit.stuba.sk

Pavol Návrat

Faculty of Informatics and Information Technologies, Slovak University of Technology, Ilkovičova, 842 16 Bratislava, Slovakia
navrat@fiit.stuba.sk

We are pleased to present a collection of papers on various topics within the area of Informatics and Information Technologies (IIT). The whole collection has been authored by students of all three levels of university education – the undergraduate, the graduate (master) and the postgraduate (doctoral). We approached selected authors of papers originally presented at the annual IIT Student Research Conference, IIT.SRC 2013 which was organized by the Slovak University of Technology in Bratislava and attended by its students studying various study programmes at its Faculty of Informatics and Information Technologies.

The IIT.SRC Conference has its program committee, reviewers, reviewing process and accepting/rejection procedure. This year, the Conference attracted 85 research papers from which 77 papers authored by 89 student authors were accepted (12 bachelor, 32 master, 33 doctoral papers). The number of papers slightly varies each year. This year we have noticed little decrease in bachelor and master categories and an increase in doctoral category comparing to IIT.SRC 2012.

A special award committee reevaluated all the papers and selected the best ones in two main categories: 5 papers for Dean's award and 1 best paper authored by Bachelor, Master and Doctoral authors each. Thus in this second round of selection process, totally 8 papers were selected out of those 77 accepted. This selection became the basis for our editorial work on this special section. We re-read carefully each of these awarded papers and were pleased to be able to conclude that indeed, they (more precisely, their authors) could be invited to submit an amended version of their paper to this special section. >From the 8 papers we present here 6 revised amended papers.

Two authors politely declined our invitation as they have already submitted or were in the process of submitting their papers elsewhere. There are even cases of other authors who were able to write new papers based on a substantial expansion of their awarded papers and submit them to international conferences or scientific journals. Some of them have got their new paper already accepted for publication at time of publication of this issue.

The papers in this section appear sorted by name of the first author, which is a rather arbitrary criterion. Let us present here the papers according to their broad themes. These 6 papers cover topics of computer vision (M. Jakab, M. Kottman), information systems (P. Krátky, J. Ševcech), computer networks (M. Olšovský) and artificial intelligence (D. Soós). M. Jakab presents an approach to image recognition on mobile platform using local descriptors. Descriptor based on a histogram of intensity of the selected pixels around the key-point is used in the

combination with FAST key-point detector. M. Kottman is concerned with binary feature descriptors, which allow to capture much larger number of features comparing with traditional descriptors based on numeric vectors. He proposed an extension of the FREAK descriptor by extending the sampling from a single pair comparison to sampling multiple points along a line between a pair. P. Krátky explores user profiling options of computer games by examining how game features and personality traits affect user (player) engagement and game play. J. Ševcech proposed a method for searching related web documents to currently studied document employing annotations created by the reader. Annotations serve as indicators of the reader's interest in particular parts of the document. A particular contribution to the domain of computer networks can be found in the paper multi-parameter TCP congestion control by M. Olšovský. The author proposes an advanced notification system for TCP congestion, which allows TCP flows prioritization based on the flow age and carried priority. D. Soós investigates optimization algorithm inspired by social insect behavior where a swarm of bees interacts with the whole beehive based on principles of multiagent approach and new solutions are generated each generation thanks to the mutation.

These 6 papers give a reasonably good overview of scope and quality of the student research at the Slovak University of Technology in Bratislava in the areas of informatics and information technologies. To give a reader broader view into the topics researched by students and presented at the student research conference IIT.SRC 2013 we include the list of all awarded papers including those presented in this section.

We hope this special section will encourage our students even more to work hard in their research projects to achieve excellent results. We also hope their results will be interesting to a wider community.

IIT.SRC 2013 Awarded Papers

Best Paper Award

Bachelor (Bc.) Degree Program Category

Marek Jakab: Planar Object Recognition in an Augmented Reality Application on Mobile Devices
(supervisor: Vanda Benešová)

Master (Ing.) Degree Program Category

Ján Súkeník: Detection of Code Clones: Necessity or a Myth? (supervisor: Peter Lacko)

Doctoral (PhD.) Degree Program Category

Michal Olšovský: Advanced Notification System for TCP Congestion Control (supervisor: Margaréta Kotočová)

Dean's Award

- Peter Krátky: What Makes the Best Computer Game? How Game Features Affect Game Play (supervisor: Jozef Tvarožek)
- Michal Kottman: Improving Binary Feature Descriptors Using Spatial Structure (supervisor: Martin Šperka)
- Karol Rástočný: Usability of Anchoring Algorithms for Source Code (supervisor: Mária Bieliková)
- Daniel Soós: Optimization Algorithm Inspired by Social Insect Behaviour in Comparison with Hill Climbing (supervisor: Dávid Chalupa)
- Jakub Ševcech: Related Documents Search Using User Created Annotations (supervisor: Mária Bieliková)

ACM Slovakia Chapter Prize

- Jozef Harinek: Extracting Keywords from Educational Content (supervisor: Marián Šimko)
- Michal Kompan: User's Satisfaction Modelling in Personalized Recommendations (supervisor: Mária Bieliková)

- Štefan Sabo: Social Insect Inspired Approach for Visualization and Tracking of Stories on the Web (supervisor: Pavol Návrat)
- Ivan Srba: A Study on Influence of Students' Personal Characteristics on Collaborative Learning (supervisor: Mária Bieliková)
- Jakub Šimko: Crowdsourcing in the Class (supervisor: Mária Bieliková)

Czechoslovakia Section of IEEE Prize

- Martin Hrubý: Traffic Engineering Based on Statistical Modeling (supervisor: Margaréta Kotočová)
- Štefan Krištofik: Efficient Repair Rate Estimation of Redundancy Analysis Algorithms for Embedded Memories (supervisor: Elena Gramatová)
- Marián Maruniak: Binary Decision Diagram Optimization Method Based on Multiplexer Reduction Methods (supervisor: Peter Pišteň)
- Martin Nagy: New Security Architecture for Mobile Data Networks (supervisor: Ivan Kotuliak)
- Martin Vojtko: Modular Operating System (supervisor: Tibor Krajčovič)