

# **2015 4th Eastern European Regional Conference on the Engineering of Computer Based Systems (ECBS-EERC 2015)**

**Brno, Czech Republic  
27-28 August 2015**



**IEEE Catalog Number: CFP15ECB-POD  
ISBN: 978-1-4673-7968-7**

# **2015 4th Eastern European Regional Conference on the Engineering of Computer Based Systems**

## **ECBS-EERC 2015**

### **Table of Contents**

|                                                                                      |      |
|--------------------------------------------------------------------------------------|------|
| Foreword.....                                                                        | viii |
| Organizing Committee.....                                                            | ix   |
| Program Committee.....                                                               | x    |
| Reviewers .....                                                                      | xi   |
| Keynote: The Democratization of Software<br>Systems Development by Jon Whittle ..... | xii  |

---

### **Software Engineering**

|                                                                                          |    |
|------------------------------------------------------------------------------------------|----|
| Semantic Formative E-Assessment for Project Management Professionals .....               | 1  |
| <i>Dascalu Maria-Iuliana, Bodea Constanta-Nicoleta, and Marin Iuliana</i>                |    |
| Preserving Use Case Flows in Source Code .....                                           | 9  |
| <i>Michal Bystrický and Valentino Vranić</i>                                             |    |
| An Opportunistic Approach to Retaining Use Cases in Object-Oriented Source<br>Code ..... | 17 |
| <i>Ján Greppel and Valentino Vranić</i>                                                  |    |
| Empirical Metadata Maintenance in Source Code Development Process .....                  | 25 |
| <i>Karol Rastocny and Maria Bielikova</i>                                                |    |
| Software Service Recommendation Using Context .....                                      | 32 |
| <i>Ivan Martoš and Viera Rozinajová</i>                                                  |    |

## Embedded Systems and Networking

|                                                                                                                                                |    |
|------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Comparison of Generally Applicable Mechanisms for Preventing Embedded<br>Event-Driven Real-Time Systems from Interrupt Overloads .....         | 39 |
| <i>Josef Strnadel</i>                                                                                                                          |    |
| Performance Evaluation and Implementation of IP and Robust Header<br>Compression Schemes for TCP and UDP Traffic in the Wireless Context ..... | 45 |
| <i>Máté Tömösközi, Patrick Seeling, Péter Ekler, and Frank H.P. Fitzek</i>                                                                     |    |
| Quantitative Analysis of the Internet Topology Model .....                                                                                     | 51 |
| <i>Dušan Bernát and Pavel Čičák</i>                                                                                                            |    |

## Parallel and Distributed Systems

|                                                                                                                                                                                                              |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Work, Span, and Parallelism of Transactional Memory Programs .....                                                                                                                                           | 59 |
| <i>Miroslav Popovic, Branislav Kordic, and Ilija Basicovic</i>                                                                                                                                               |    |
| Distributed/Parallel Genetic Algorithm for Road Traffic Network Division Using<br>Step Parallelization .....                                                                                                 | 67 |
| <i>Tomas Potuzak</i>                                                                                                                                                                                         |    |
| Flexible Algorithms: Enabling Well-Defined Order-Independent Execution<br>with an Imperative Programming Style .....                                                                                         | 75 |
| <i>Raphael B. Yehezkael, Moshe Goldstein, David Dayan, and Shimon Mizrahi</i>                                                                                                                                |    |
| EFL: Implementing and Testing an Embedded Language Which Provides Safe<br>and Efficient Parallel Execution .....                                                                                             | 83 |
| <i>David Dayan, Moshe Goldstein, Shimon Mizrahi, Max Rabin, Devora Berlovitz,<br/>Or Berlovitz, Elad Bussani Levy, Moshe Naaman, Mor Nagar, Ditsa Soudry,<br/>Raphael B. Yehezkael, and Miroslav Popovic</i> |    |

## Autonomic and Computer Vision Systems

|                                                                                               |     |
|-----------------------------------------------------------------------------------------------|-----|
| Edge Preserving Range Image Smoothing by Rotated Bilateral Sampling .....                     | 91  |
| <i>Viktor Kovacs, Kristof Csorba, and Gabor Tevesz</i>                                        |     |
| Efficiency Aspects of Orientation Estimation with Optical Flow on Mobiles .....               | 98  |
| <i>László Kundra and Péter Ekler</i>                                                          |     |
| A Planning Method to Obtain Good Quality Paths for Autonomous Cars .....                      | 104 |
| <i>Domokos Kiss, Gábor Csorvási, and Ákos Nagy</i>                                            |     |
| Speedup of the Microscopic Road Traffic Simulation Using Aggregated<br>Vehicle Movement ..... | 111 |
| <i>Tomas Potuzak</i>                                                                          |     |

## Industrial Reports

|                                                                                                   |     |
|---------------------------------------------------------------------------------------------------|-----|
| An Efficient Adaptive Method of Software-Based Self Test Generation<br>for RISC Processors .....  | 119 |
| <i>Ján Hudec</i>                                                                                  |     |
| Hybrid Control-Flow Checking with On-Line Statistics .....                                        | 122 |
| <i>Maroš Ďuríček and Tibor Krajčovič</i>                                                          |     |
| DPM-PSTM: Dual-Port Memory Based Python Software Transactional<br>Memory .....                    | 126 |
| <i>Branislav Kordic, Miroslav Popovic, and Ilija Basicevic</i>                                    |     |
| Performance Evaluation of In-kernel System Calls .....                                            | 130 |
| <i>Cristian Condurache, Lucian Mogosanu, Mihai Carabas, Laura Gheorghe,<br/>and Nicolae Tapus</i> |     |
| A Benchmark Proposal for Route-Planning of Urban Bus Service .....                                | 134 |
| <i>Fatih Kılıç and Mustafa Gök</i>                                                                |     |
| A Profiling Tool for Heterogeneous Multi-core Systems .....                                       | 138 |
| <i>Ivan Povazan, Momcilo Krunić, and Miroslav Popovic</i>                                         |     |

## Poster Abstracts

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Hardware Accelerated Scheduling in Real-Time Systems .....              | 142 |
| <i>Lukáš Kohútka, Martin Vojtko, and Tibor Krajčovič</i>                |     |
| Migration of a Modular Operating System to a Intel Atom Processor ..... | 144 |
| <i>Ladislav Kobza, Martin Vojtko, and Tibor Krajčovič</i>               |     |
| Author Index .....                                                      | 146 |