Table of Contents

Foreword

Organizing Committee

Invited Speakers

High Performance Computing: a tool to foster European Competitiveness
  Catherine Rivière
Test Solution for Nanoscale Systems-on-Chip: Algorithms, Methods and Test Infrastructure
  Yervant Zorian and Samvel Shoukourian

Section 1: Design and Test

SAT-Based Approaches to Verification of Logical Descriptions with Functional Indeterminacy
  Liudmila Cheremisinova
A Toolset for Easy Development of Test and Repair Infrastructure for Embedded Memories
  Aram Khzarjyan
A Quick Power Consumption Estimation Method for RTL Compilers
  Lusine Martirosyan
NMOS/PMOS Resistance Calibration Method Using Reference Frequency
  Vazgen Melikyan, Abraham Balabanyan, Artak Hayrapetyan, and Armen Dyraurgaryan
Data - Clock Setup and Hold Times Margins Correction Method in High Speed Serial Links
Vazgen Melikyan, Arthur Sahakyan, Aram Shishmanyan, Nazeli Melikyan, and Grigor Zargaryan

Section 2: Algorithms, Automata and Logic

Invariants in Symbolic Modeling and Verification of Requirements
Alexander Letichevsky, Alexander Godlevsky, Anton Guba, Alexander Kolchin, Oleksandr Letychevskyi, and Vladimir Peschanenko

On the Existence of the $tt$-mitotic Low Set, which is not $btt$-mitotic
Arsen Mokatsian

On Computation of De Morgan and Quasi-De Morgan Functions
Yuri Movsisyan and Vahagn Aslanyan

On the Logical Semantics of the Symmetric Constructive Logic Based on the Properties of Recursively Enumerable Sets
Igor Zaslavsky

Section 3: Discrete Mathematics and Combinatorial Analysis

On the Optimality of the Hash-Coding Type Nearest Neighbour Search Algorithm
Levon Aslanyan and Hayk Danoyan

A Note on Long non-Hamiltonian Cycles in One Class of Digraphs
Samvel Darbinyan and Iskandar Karapetyan

Broadcasting in the Knödel Graph
Hayk Grigoryan and Hovhannes Harutyunyan

Indivisible Lines in the Space of Discrete Geometries
Yuri Grigoryan

On Interval Edge-colorings of Complete Tripartite Graphs
Andrzej Grzesik and Hrant Khachatrian

New Methods of Construction of Fault-Tolerant Gossip Graphs
Vilyam Hovnanyan, Vahagn Poghosyan, and Suren Poghosyan

$(0, 1)$-Matrices with Different Rows
Hasmik Sahakyan

Section 4: Information Theory and Coding Theory

On the Shannon Cipher System with Distortion and Guessing Wiretapper Eavesdropping through a Noisy Channel
Tigran Margaryan and Evgueni Haroutunian

Reconstruction of Quantum Information After the Measurement
Sergey Poghosyan and Taksu Cheon

Inversion in Finite Fields with the aid of Hankel Polynomials
Alexei Uteshev and Ivan Baravy
Section 5: Cognitive Algorithms and Models

A Gate Model of Emotional Learning
Suren Khachatryan and Khosrov Grigoryan

On Adequate and Constructive Models of Processing of Meanings
Edward Pogossian

A Model of a High Level Chess Concept "Beautiful Mate"
Vachagan Vahradyan

Section 6: Pattern Recognition and Image Processing

On Knowledge-Based Gene Expression Data Analysis
Arsen Arakelyan, Levon Aslanyan, and Anna Boyajyan

Method for Detection of Image Tampering and Partial Recovery
David Asatryan, Naira Asatryan, Natalya Lanina and Alexander Petrosyan

On an Approach to Object Recognition in X-ray Medical Images and Interactive Diagnostics Process
Nikita Chernuhin

Accelerometer and GPS Sensor Combination Based System for Human Activity Recognition
Sahak Kaghyan and Hakob Sarukhanyan

Automatic Detection and Concealment of Specular Reflections for Endoscopic Images
Gevorg Karapetyan and Hakob Sarukhanyan

Alignment-Free Fuzzy Vault Scheme for Fingerprints
Gurgen Khachatryan, Aram Jivanyan and Hovik Khasikyan

A Multimodal Biometric System Based on Fingerprint and Signature Recognition
Davit Kocharyan, Vahe Khachaturyan, and Hakob Sarukhanyan

Muscle-Based Skeletal Bipedal Locomotion Using Neural Evolution
Artyom Topchyan and Tigran Topchyan

Section 7: Parallel and Distributed Computing

Towards Exascale with the ANR-JST Japanese-French Project FP3C
Gabriel Antoniu, Taisuke Boku, A. Buttari, Christope Calvin, Philippe Codognet, Michel Daydé,
Nahid Emad, Yutaka Ishikawa, G. Joslin, Satoshi Matsuoka, Kango Nakajima, Hiroshi Nakashima,
Raymond Namyst, Serge Petiton, Tetsuya Sakurai, Mitsuhisa Sato

Virtual Private Supercomputer: Design and Evaluation
Ivan Gankevich, Vladimir Gaisdushok, Dmitry Gushchanskiy, Yuri Tiptin, Vladimir Korkhov, Alexander Degtyarev,
Alexander Bogdanov and Valeriy Zolotarev

An Automatic Tool for Tuning Compiler Optimizations
Dmitry Plotnikov, Dmitry Melnik, Mamikon Vardanyan, Ruben Buchatskiy, and Roman Zhuykov
E-Infrastructures in Armenia: Virtual Research Environments

Yuri Shoukourian, Vladimir Sahakyan, and Hrachya Astsatryan

**Section 8: Cloud and Grid Computing**

Combined Approach to Solving Problems in Binary Code Analysis

*Alexander Getman, Vartan Padaryan, and Mikhail Solovyev*

Performance Optimizations in an LLVM-based Cloud Application Store

*Viktor Ivanikov, Shamil Kurmangaleev, Andrey Belevantsev, and Arutyun Avetisyan*

**Section 9: Telecommunication and Networking**

Optimal Node scheduling for Integrated Connected-Coverage in Wireless Sensor Networks

Levon Aslanyan, Hakob Aslanyan and Hamid Khosravi

**Section 10: Information Technologies and Applications**

Getting Serious About Integrating Decision Support Mechanisms into Geographic Information Systems

*Jonathan Frez, Nelson Baloia, and Gustavo Zurita*

Development of Electronic Training Materials at the Institute for Computer Science and Control, Hungarian Academy of Sciences

*Zsolt László Márkus, Tibor Szkaliczki, and György Szántó*

High Speed Water Monitoring Systems Based on Digital Holographic Microscopy

*László Orzó, Balázs Wittner, and Szabolcs Tókés*

Components in Model-Based Software Development

*Enn Tyugu and Pavel Grigorenko*

Graphical Programming and Program Correctness Proof

*Igor Velbitskiy*

**Author Index**