
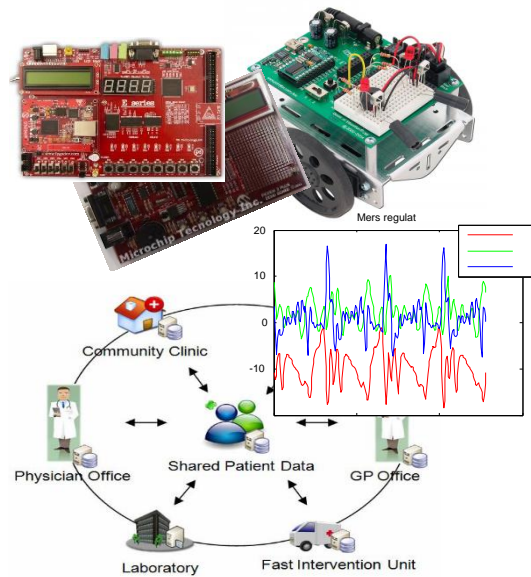


EMBEDDED AND DEDICATED COMPUTER SYSTEMS LABORATORY

Contact details

Name	Embedded and Dedicated Computer Systems
Acronym	eDCS
Logo	
Site	http://users.utcluj.ro/~sebestyen/eDCS.html http://research.utcluj.ro/tl_files/research/Research%20Domain/Computer%20Science/5_Sebestyen.pdf
Address	26-28 G. Baritiu Str., 400027, Cluj-Napoca, Romania
Faculty Department	Faculty of Automation and Computer Science Computer Science Department
Telephone	+40 264 401489
Fax	+40 264 594491
Director	Prof. Dr. Eng. Gheorghe Sebestyen
e-mail	gheorghe.sebestyen@cs.utcluj.ro



Areas of expertise

Embedded systems, Dedicated digital systems and FPGA-bases systems

Modeling, design and implementation of hardware & software systems adapted for various applications in industrial, medical and security domains.

Real-time systems:

Real-time systems modeling and design, scheduling strategies and simulation

eHealth systems:

Design and implementation of distributed medical information systems and remote patient monitoring applications

Real random number generators and Cryptography:

Design and implementation of Real random generators based on the exploitation of physical phenomena known for their intrinsic random nature (eg quantum phenomena).

Digital Libraries:

Design and implementation of dedicated digital content management systems.

Team

Prof. Dr. Eng. Gheorghe Sebestyen, Prof. Dr. Eng. Octavian Creț, Prof. Dr. Eng. Alin Suciuc, Assoc. Prof. Dr. Eng. Lucia Vacariu, Assist. Prof. Dr. Eng. Kinga Marton

PhD students: Eng. Ciprian Oprisa, Eng. Sandor Lukacs, Eng. George Cabau, István Kiss

Representative projects

OANA - Onboard nonlinear analysis of data: a new technology based on field programmable gate arrays, STAR 2017, <http://www.spacescience.ro/projects/oana/>, (2017-2019)

“**Dynamic Partial Reconfiguration for FPGA Devices**”, international project with third parties (company National Instruments USA), http://users.utcluj.ro/~sebestyen/eDCS.html#_Recent_research_results: (2012-2013), (2015-2016)

CyberWater, “**Prototype Cyberinfrastructure-based System for Decision-Making Support in Water Resources Management**”, PNI PCCA (Joint Applied Research Project), <http://cyberwater.cs.pub.ro/drupal-7.17/> (2012-2015)

Jeopard, “**Java Environment For Parallel Realtime Development**”, European FP7 project, http://www.jeopard.org/index.php?option=com_content&view=article&id=53&Itemid=58 (2007-2010)

PRO-INOVA, “**Educational Program in Innovation Management**”, POSDRU/21/1.5/G/24239,

<http://platinova.utcluj.ro/DetaliiProiect/index.php> (2010-2012)

CryptoRand, “**A High Performance System for Generation and Testing of Random Number Sequences for Cryptographic Applications**”, <http://cryptorand.utcluj.ro/> (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. Sebestyen, Gheorghe; Hangan, Anca; Czako, Zoltan; et al., A Taxonomy and Platform for Anomaly Detection, 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA) Location: Cluj Napoca, ROMANIA Date: MAY 24-26, 2018
2. G. Sebestyen and A. Hangan, "Anomaly detection techniques in cyber-physical systems," Acta Universitatis Sapientiae Informatica, vol. 9, no. 2, pp. 101-118, Dec 2017.
3. K. Marton, A. Zaharia, S. Banescu, and A. Suciu, "Randomness Assessment of an Unpredictable Random Number Generator based on Hardware Performance Counters," Romanian Journal of Information Science and Technology, vol. 20, no. 2, pp. 136-160, 2017.
4. H. Sandor and G. Sebestyen-Pal, Optimal Security Design in the Internet of Things (2017 5th International Symposium on Digital Forensic and Security). New York: Ieee, 2017.
5. G. Hajmasan, A. Mondoc, and O. Cret, Dynamic Behavior Evaluation for Malware Detection (2017 5th International Symposium on Digital Forensic and Security). New York: Ieee, 2017.
6. K. Marton, B. Raluca, A. Suciu, and Ieee, "Counting Bits in Parallel," in 2017 16th Roedunet Conference: Networking in Education and Research(RoEduNet International Conference, New York: Ieee, 2017.
7. Gheorghe Sebestyen, „Real-time communications, from industrial networks toward IoT (Internet of Things)”, plenary presentation at *ICCC 2015*, Hungary, 2015
8. Gheorghe Sebestyen, Dan Muresan, Anca Hangan, “Road Quality Evaluation with Mobile Devices”, *proceedings of ICC 2015*, Hungary 2015
9. Ciprian Oprisa, George Cabau, and Gheorghe Sebestyen Pal. “Semi-automated verdicts assignment for potentially malicious programs”, In *IEEE International Conference on Intelligent Computer Communication and Processing (ICCP)*, Cluj-Napoca, Romania, 2015
10. A. Zene, C. T. Chirap, O. Cret, and L. Vacariu, "Efficient Hardware Implementation of Snapshotting Algorithms for NoC Applications," *Romanian Journal of Information Science and Technology*, vol. 18, pp. 79-92, 2015.
11. István Kiss, Béla Genge, Piroska Haller, Gheorghe Sebestyén, “Data Clustering-based Anomaly Detection in Industrial Control Systems” , *ICCP 2014 Intelligent Computer Communication and Processing (ICCP)*, Cluj-Napoca, 2014
12. Mădălin Neagu, Gheorghe Sebestyen , “Increasing Memory Security through Data Scrambling and Information Entropy Models”, *15th IEEE International Symposium on Computational Intelligence and Informatics* Budapest, Hungary, 2014
13. K. Marton, M. Homan, A. Suciu, I. Rasa, “The histogram test for randomness assessment”, in *Proceedings of the IEEE International Conference on Networking in Education and Research - RoEduNet 2013*, Constanța, 2013, pp. 1-5

Tools and platforms developed:

CARDIONET - Computerized healthcare system designed to provide tracking and management of patients with cardiovascular disease

Platnova - Platform type digital library for the acquisition, storage, processing and retrieval of information contained in patents

RTMultiSim - Integrated simulation and optimization of real-time systems on parallel and distributed structures

CryptoRand - Integrated high performance system for generating and testing sequences of random numbers for cryptographic applications

The offer addressed to the economic environment

Research & development	Efficient strategies for scheduling communication and tasks on real-time parallel and distributed architectures; integrated modeling, simulation and optimization of real-time systems. Advanced techniques for generating random numbers with applications in cryptography. Reconfigurable computer system Portable medical devices - for continuous monitoring of patients for prophylactic treatment of chronic diseases. Digital content management systems. Real high quality random number generators, high flow (Mbps) or very high (Gbps). Advanced software systems for testing random sequences. Systems for mobile robots Sensor networks for monitoring rivers
Consulting	Design of dedicated systems based on specialized processors and FPGA circuits. Development of real-time applications. Cryptography and random number generators Evaluating the quality of a random number generators. Evaluation of algorithms using random number generators Industrial Informatics, industrial networks, dedicated devices based FPGA circuits According to TRNG design and implementation of user specifications, wireless Sensor Networks
Training	Computer Architecture, Industrial Informatics, Digital circuit design, using FPGA circuits, quality systems, Cryptography. Training on proper use of random number generators in various types of applications, focusing on cryptographic applications. Training on methods of generating random sequences, with emphasis on real random generators