



University POLITEHNICA of Bucharest
Faculty of Automatic Control and Computers

Splaiul Independenței nr.313, sector 6, cod 060042,
Bucharest, ROMANIA



Prof.dr.ing. Valentin SGARCIU

Scientific coordinator PhD in the "System Engineering"
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Doctoral School of Automatic Control and Computers
Politehnica University of Bucharest

Contact:

Prof.dr.ing. Valentin Sgarciu
Politehnica University of Bucharest
Faculty of Automatic Control and Computer Science
Department of Control Engineering and Industrial Informatics
313, Splaiul Independenței, room ED410, sector 6, 060042, Bucharest
Romania
Tel: +40 21 4029310, Fax: +40 21 3170912
E-mail: valentin.sgarciu@upb.ro or vsgarcIU@aii.pub.ro
Web: www.aii.pub.ro
LinkedIn: www.linkedin.com/in/valentin-sgarciu

Research Profile:

General research topic: Electric Automation, in which we distinguish the directions:

- Acquisition systems, data processing and transmission, which have been deepened and research will be followed through wireless sensor networks, last generation industrial systems with minimal energy consumption, new data acquisition and processing technology obtained from sensory systems;
- Automated systems distributed in the concept of intelligent building (BMS, BI, BA) with modern categories of subsystems for monitoring and supervising the characteristic measurements of cities / smart buildings;
- Protection of information and of the person using modern techniques for encryption/decryption, digital signatures and certification, combined with smart cards and RFIDs;

- Intelligent products based on P2P and M2M type communications, that use smart technologies developed within the IoT concept;
- Other categories of research submitted to the general framework, that can bring added scientific value and products / technologies.

PhD Coordinator since 2008;

- 10 finalized theses;
- 8 theses in progress;

Scientific publications: 10 monograph / book chapters; 161 articles and scientific papers.

Research Projects (selection, from the past 10 years):

- 2006-2008, *SMCID, technological demonstrator for the management of electronic identity cards based on Multi-application smartcards* - Contract nr.41R/21.12.2005, the beneficiary M.Ed.C – Agency for Scientific Research - Romanian Space Agency, Inter-ministry Group for Security Research, project director from UPB.
- 2006-2008, *AYDIGEF, Research on spatial-temporal dynamics of the earth's magnetic field aiming the construction of geomagnetic models unitary for Romania integrated in the European and global context* – CEEEX contract - 2006-2008, AMTRANS beneficiary, project director of UPB, project coordinator Institute of Geodynamics "Sabba S. Stefanescu" of the Romanian Academy.
- 2007, Integrated system for development of secure electronic transactions in open-platform technology, cod CNCSIS 655, director.
- 2008, *SPENS, Electronic mail service non-repudiation secured with legal value*, AMCSIT, director of the UPB.
- 2008, *SIMPARK, Integrated system of urban parking management*, AMCSIT, 168/09.07.2008, director of the UPB.
- 2008-2011, *SMESIS, Effective and safe electronic healthcare services based on PKI infrastructures and smart cards*, CNMP Partnerships, contract 12125/01.10.2008, director.
- 2008-2011, *PLATSEC, Integrated informatics platform for the secure management of personal data based on smart cards and PKI infrastructures*, CNMP Partnerships, contract 82105/01.10.2008, director

Membership in organizations and scientific committees: SRAIT, SRM, IEEE

Proposed doctoral research themes:

1. *Research on multilevel computer security solutions*, which will consider, using the latest technologies based on PKI solutions, the use of elliptic curves in establishing the encryption/decryption key and inspection as correct transmission of messages based on digital signature. The overall objective is linked to ensuring a high secure data transmission over the Internet with high dynamic performance.

2. *Wireless sensor networks in inaccessible environments*, the theme will have as overall aim the realization of software applications for potentially explosive or harmful environments (NO_xe) by linking data on position, durability, danger level, compliance with environmental standards. We intend to realize the storage and handling of substances associated with these environments with intelligent systems of M2M or P2P type.
3. *Research on engineering and business process management*, aiming at finding appropriate informatics techniques to analyse business processes, for which to propose informatics solutions for modeling the business processes and to conduct case studies on specific aspects of these processes (advanced workforce recruitment, internal flow of documents, access to sensitive information etc.).
4. *Cloud-enabled SCADA systems using OPC UA theme*, which aims to achieve an unified conceptualization of OPC Server for SCADA applications from Cloud with new communications and security concepts as well as in terms of way of working in the cloud. The intention is to find new solutions for managing complex distributed processes by transposing the objective function in a cloud configuration with unified architecture.
5. *Modern concepts of communication in IoT*, at which they will try to achieve an unified approach to securing information from/to smart objects from an ambient environment, both in the local communication (through M2M or P2P techniques), but especially the communication distance where current solutions are heterogeneous and with low security rate.