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Alexandru Costan

Research Interests

I am interested in the design and evaluation of large-scale distributed computer systems with application in e-Science and in virtual environments. I have so far had the chance to monitor Grid and Peer-to-Peer (P2P) systems, to build performance evaluation models and tools for such environments, and to work on resource management solutions for Grids, P2P systems and high-speed networks. I am looking forward for opportunities to build upon these research activities.

Education

2006-present Politehnica University, Bucharest, Romania

Ph. D. Thesis in Computer Science

- The subject of the thesis: "Data Storage, Representation and Interpretation in Grid Monitoring Environments"
- Supervisor: Professor Valentin Cristea (UPB)
- Research interests: Grid Applications, Grid and P2P Monitoring, Distributed Databases, High Speed Networks

1999–2004 Politehnica University, Bucharest, Romania

B.Sc. in Computer Science / Engineer in Computer Science

- **Engineering Diploma Thesis:** *Distributed Delay Constrained Multicast Algorithms*. Supervisors: Professor Iosif Legrand (Caltech) and Professor Valentin Cristea (UPB). Diploma Thesis graded 10 / 10.
- MAJOR: Computer Science and Engineering. Specialization: *System Software* (with courses on *Operating Systems, Compilers, Databases, Parallel and Distributed Computing*).
- Other relevant courses: *Advanced Data Structures and Algorithms, Software Engineering, Digital Computers, Formal Languages and Automata, Computer Graphics, Artificial Intelligence, Computer Networks, Microprocessor Based Systems Design, Numerical Methods*.
- **GPA:** 9.37 / 10.00 (**93.7%**, the 10th from approx. 300 students).

2002 – 2003 Ecole Polytechnique, Paris, France

- Classes of Majeure I, II Informatique.
- Relevant courses: *Databases, Automata Theory, Algorithms Conception and Analysis, Programs Verification*.
- Research Internship Project graded A.

1995 – 1999 "Andrei Saguna" National College, Brasov

- Attended national Mathematics and Physics Olympiads.
- Graduation Baccalaureate mark: 9,83 / 10 (the 3rd from approx. 200 graduates).

Professional experience

October 2004 – present Politehnica University, Bucharest, Romania

Teacher Assistant

- Teaching course of “Parallel and Distributed Algorithms” at the Computers Department.
- Responsible with seminars, proposing and grading exercises, homework and projects for courses of “Parallel Processing Algorithms”, “Communication Protocols” at the Computers Department.
- Conducting diploma thesis of graduating students on Distributed Systems.
- Teaching on Grid Monitoring at Grid Summer Schools in UPB.

December 2004 – present RoGRID Laboratory, Bucharest, Romania

Software Developer

- Development of monitoring tools, performance evaluation and resource management applications for Grids, P2P systems and high speed networks in several research projects (see below).

July – September 2001 Splash Software, Brasov, Romania

Software Developer

- Development and optimization of encoding / decoding applications.
- Developing of analysis instruments for MPEG audio / video standard.

Research Internships

June - July 2009 INRIA Bretagne-Atlantique, Rennes, France

- **Paris** project, integrated MonALISA support for autonomic behavior within BlobSeer, a large scale storage management service, conducted evaluation and performance tests on Grid5000
- Hosts: Dr. Gabriel Antoniu (INRIA Rennes), Professor Luc Bouge (ENS Cachan)

March - April 2007 University of Technology, Delft, Netherlands

- **ServMark** project, conducted simulation tests on Grid5000 and DAS multi-cluster grid
- Host: Dr. Alexandru Iosup (TUDelft)

March – September 2003 INRIA Rocquencourt, Paris, France

- Developing a new method of static analysis by abstract interpretation (through equation resolution in the lattice of intervals).
- Implementing and testing an analyzer for a high level language, close to simple C.
- Hosts: Professor Stephane Gaubert (CEA) and Professor Eric Goubault (CEA / INRIA).

Courses

September 2007 Politehnica University, Bucharest, Romania

- IBM Cell Programming Workshop.

June 2007 Evtek Institute of Technology, Espoo, Finland

- Improving the Security Knowledge in ICT - Advanced Technologies Intensive Programme. Graduation mark: 5/5.

June 2002 IBM e-Business Laboratory, Bucharest, Romania
▪ Hands-on *WebSphere* and *Visual Age* courses.

2001 – 2002 CISCO Networking Academy, Bucharest, Romania
▪ 1st and 2nd Semesters. Graduation mark: 10 / 10.

Workshops, Summer Schools

- Co-Organizer and Reviewer of International Workshop on High Performance Grid Middleware (**HiperGrid**), 2007- Present
- Co-Organizer / Coordinator of training of the UPB Summer Schools in Grd Technology (**GridInitiative**), 2004 - Present
- Co-Organizer of The 1st International Workshop on Global Computing, 2007.

Awards and Grants

- October 2008: National University Research Council (Ministry of Education and Research) grant for the Ph. D. research project *Data Storage, Interpretation and Representation in Grid Environments* (top ranked **96%**, out of 500 applicants).
- October 2007: ORACLE Honors Ph. D. Award.
- October 2006: UPB Ph. D. honors scholarship.
- March 2006: *Innovation Award for High-Performance Applications* from CENIC - *Corporation for Education Network Initiatives in California* (work on MonALISA).
- June 2004: First prize at the Students Scientific Conference from the Politehnica University of Bucharest (the *Internet Systems and Applications* section), for the “Distributed Multicast Algorithms for MonALISA framework” project.
- June 2003: “*Tres Honorable*” mention for graduation of Ecole Polytechnique.
- 2002 – 2003: Erasmus grant for 1 year at Ecole Polytechnique.
- Merit (top 1-5%) scholarship at the Politehnica University (3 semesters out of 10); honorary (top 5-10%) study scholarship in the other 7 semesters.

Research Projects

- **MonALISA** (<http://monalisa.cern.ch>): part of the collaboration of our university with CERN (European Organization for Nuclear Research) and California Institute of Technology. MonALISA is a globally scalable framework of services to monitor and help manage and optimize the operational performance of Grids, networks and running applications in real-time. My contribution to the project: development, optimization and maintenance of repositories that collect data from monitoring services; thus the system offers the possibility to present global views from the dynamic set of services running in a distributed environment to higher level services; design of new types of data representation and interpretation (2004 – present).
- **P2P Next** (<http://www.p2p-next.org>): develops an open source, trusted, personalized, user-centric, and participatory television plus media delivery mechanism with social and collaborative connotation using the P2P paradigm. I'm responsible with the design of the monitoring framework for selected peers and the evaluation model for the monitored information (traffic, content) enabling correlations,

prediction patterns and optimised resource management decisions. (2008 - present)

- **EGEE-II** (<http://www.eu-egee.org/>): Enabling Grids for E-science, coordinated by ICI (project funded by the European Commission in FP6 program). I am responsible with developing and managing the data repository for the ALICE Grid which enables monitoring and automated decisions taking for AliEn components, other services, nodes, and network transfers traffic. I am also involved in organizing and teaching courses for GridInitives at UPB. (2006 - present)
- **PEGAF**: Grid-based experimental platform for developing applications based on workflows and with dynamic allocation of resources. I'm responsible with the design and implementation of the workflow engine enhanced for large scientific application. The engine is based on ActiveBPEL with new extensions dealing with extensive fault tolerance and data management. (2007 - present).
- **DEPSYS**: Research and development of original models, methods and techniques that satisfy dependability requirements for large scale distributed environments. I'm responsible for developing new replication and fault tolerance heuristics for large distributed systems (2008 - present)
- **SEE-GRID II** (<http://www.see-grid.eu/>): South-Eastern European Grid-enabled e-Infrastructure Development (project funded by the European Commission in FP6 programme). SEE-GRID provides specific support actions to pave the way towards the participation of the SE European countries to the Pan-European and worldwide Grid initiatives. I am responsible with maintaining and updating the SEEGRID monitoring repository, creating the collected information database and ensuring acces through web or web services. (2005 - present)
- **CNCSIS Project**: Decentralized Scheduling in Grid Environements Based on Web Services Framework. I am responsible with developing the relevant performance metrics and the evaluation system for the grid scheduler. (2007 - present)
- **EU-NCIT** (<http://euncit.hpc.pub.ro/>): NCIT leading to EU IST Excellency. Member of the project financed by the European Commission for Research, part of FP6, through SSA – Specific Support Action. My contribution to the project: responsible for creation and coordination of *State of the Art* in Grid Environments documents; organizing and lecturing summer schools for initiation in Grid technologies at UPB. (2005 - 2008).
- **GridMOSI** (<http://gridmosi.info.uvt.ro/>): Virtual Organization in Grid technology for high performance modeling, simulation and optimization. My contribution to the project: development and monitoring of a task scheduler using genetic algorithms. (2005-2008)
- **MedioGRID** (<http://mediogrid.uttcluj.ro/>): Parallel and distributed computing on grid structure for geographical and environment data. My contribution to the project: monitoring and resource usage management for the MedioGrid cluster in UPB. (2005-2008)
- **EquiPoly** (<http://cs.pub.ro/~equinox/>): Creating a modern R&D infrastructure for advanced Grid computing and a testbed for various technologies, project funded by the IBM in the Equinox Scholar Program. My contribution to the project: state-of-the-art of monitoring applications and their needed infrastructure.

Computer Skills

Programming Languages: Assembler, Pascal, C/C++, Java, Ocaml, SQL, JDBC, Prolog, XML, PHP, JSP, Servlets, JavaScript, bash scripting.

Parallel and Distributed Programming: Parallaxis, SR, MPI, OpenMP, IBM Cell, Intel Threaded Blocks.

Operating Systems: Unix (Linux, Solaris), Windows (flavours).

Servers: MySQL, Oracle, DB2, Apache

Software Tools: Eclipse, IBM WebSphere, CVS, Matlab, Apache HTTP server, Microsoft Office

Languages

- Romanian: native speaker
- English: fluent / proficient in reading, writing, speaking.
- French: fluent / proficient in reading, writing, speaking.
- Italian: beginner – spoken
- German: beginner – written, spoken

Professional Affiliations

- Association of Computer Machinery (ACM);
- Institute of Electrical and Electronics Engineers (IEEE);