

## CORINA STRATAN

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### RESEARCH INTERESTS

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distributed systems (cloud and grid computing, peer-to-peer systems), workflow management, monitoring, performance analysis, services computing

### EDUCATION

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**2008: Ph.D. in Computer Science** *Thesis:* Resource Management in Distributed Systems – Performance Monitoring and Dynamic Adaptation  
Politehnica University of Bucharest  
Romania  
*Advisors:* Prof. Valentin Cristea (Politehnica Univ. Bucharest), Dr. Iosif Legrand (Caltech)

**2004: M.Sc. in Computer Science** *Thesis:* Centralized Scheduling in Distributed Systems  
Politehnica University of Bucharest  
Romania  
*Average grade:* 10.00/10.00  
*Advisor:* Prof. Valentin Cristea

**2003: B.Sc. in Computer Science** *Average grade:* 9.69/10.00  
Politehnica University of Bucharest  
Romania  
*Diploma project grade:* 10.00/10.00  
*Advisor:* Prof. Valentin Cristea

### PROFESSIONAL EXPERIENCE

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**Vrije Universiteit Amsterdam** **December 2008 - present**  
*Postdoctoral researcher*

- currently working on ConPaaS, a Platform-as-a-Service system for hosting scalable applications
- participated to the design and development of a resource selection service for large scale distributed systems, in the XtremOS project (please see next page for details on the projects)
- co-supervising M.Sc. students

**Politehnica University of Bucharest** **October 2003 - December 2008**  
*Graduate student, Teaching assistant*

- research and development in several distributed systems projects: MonALISA, ServMark, Monarc (please see next page for details on the projects)
- instructed lab/seminar classes for the following courses: *Parallel and Distributed Algorithms, Distributed Programming Languages, C/C++ Programming, Data Structures, Communication Protocols*
- co-supervised B.Sc. student projects
- taught hands-on courses on OpenMP and MPI, organized by the National Center for Information Technology
- instructor at the GridInitiative summer school organized by Politehnica University of Bucharest in 2005, 2006, 2007

**IBM T.J. Watson Research Center**  
*Summer intern (mentor: dr. Liana L. Fong)*

**Summer 2007**

- analyzed models and use cases for dynamic adaptation in WS-BPEL business processes
- implemented a set of WS-BPEL dynamic adaptation patterns in IBM WebSphere Process Server

**IBM T.J. Watson Research Center**  
*Summer intern (mentor: dr. Liana L. Fong)*

**Summer 2006**

- proposed and analyzed solutions for building grid workflows with WS-BPEL
- identified and solved some of the interoperability issues between IBM WebSphere Process Server and the Globus toolkit

## RESEARCH PROJECTS, WITH DETAILS ON MY CONTRIBUTIONS

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**ConPaaS** (<http://www.conpaas.eu>)

**2010 - present**

*Platform-as-aService environment for hosting applications in federated clouds. It targets the most common types of cloud applications: web applications, data storage services (SQL and NoSQL) and compute-intensive applications. Our group is developing the system for hosting web applications, and our main research goals are automatic scaling and advanced Service Level Agreements. ConPaaS is a part of the Conrail EU FP7 project.*

- designing and implementing a mechanism to automatically scale web applications in order to meet their Service Level Agreements. This mechanism extends the previous work of our group and is based on profiling the performance of virtual machines and on live application monitoring
- added support for Xen in the ConPaaS web hosting service

**XtreemOS** (<http://www.xtreemos.eu>)

**2008 - 2010**

*EU FP7 project that aims to investigate and propose new services that should be added to current operating systems for building grid/cloud infrastructure in a simple way. The experimental services are built on top of a Mandriva Linux distribution. I am working in a team that develops a decentralized resource selection service based on a peer-to-peer overlay.*

- introduced support for runtime adaptation in the resource selection service; this allows to dynamically reconfigure the set of attributes that describe the resources
- improved the peer-to-peer protocol in order to increase the convergence speed of the overlay
- set up and maintenance for an XtreemOS testbed at Vrije Universiteit Amsterdam

**MonALISA** (<http://monalisa.caltech.edu>)

**2005 - 2008**

*Platform for monitoring and controlling large scale distributed systems, developed in collaboration at Caltech, CERN and Politehnica University of Bucharest. MonALISA is designed as an ensemble of distributed services that cooperate in performing a wide range of information gathering and processing tasks.*

- designed and implemented a set of modules for collecting and processing resource usage accounting information from multiple types of resource management systems (Condor, PBS, LSF, SGE); provided support for using the monitoring modules in the Open Science Grid (<http://opensciencegrid.org>)
- designed and implemented ApMon, a lightweight monitoring library that can be embedded in a wide range of applications for collecting job information, system information and user defined parameters; the library is also included in the AliEn middleware developed at CERN (<http://alien.cern.ch>).

**ServMark** (<http://dev.globus.org/wiki/Incubator/ServMark>)

**2007 - 2008**

*Instrument for performance analysis in Grids, jointly developed at University of Chicago, Delft University of Technology, University of British Columbia and Politehnica University of Bucharest.*

- introduced a benchmark-based method for performance testing of grid workflow engines, and a set of workflow performance metrics

- implemented the benchmarks and tested several middleware stacks (workflow engine + resource management system)

**MONARC** (<http://monarc.cacr.caltech.edu>)

**2003 - 2005**

*Distributed systems simulator written in Java, developed in collaboration at Politehnica University Bucharest, CERN and Caltech.*

- extended and optimized the modules for simulating processing nodes
- designed and run simulation experiments for data processing activities, job scheduling, minimum spanning tree computation in overlay networks
- made multi-threading performance tests on multiprocessor platforms (Sun Enterprise 10000, multicore PCs)

**Codestar**

**2002**

*Electromagnetic circuits simulator developed by a group of European institutes, including Politehnica University of Bucharest.*

- co-developed a C++ library for linear equation systems and sparse matrices
- contributed to the implementation of a technique for discretizing the Maxwell equations

**EU-NCIT**

**2005 - 2008**

*Specific Support Action project funded through the European Union FP6 programme, with the purpose of consolidating the research potential of NCIT (National Centre for Information Technology).*

- co-authored the project proposal which was ranked first among 72 submitted proposals
- participated in organizing the project activities (workshops, talks, meetings etc.)

**AWARDS & GRANTS**

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- **2006, 2007:** IBM Ph.D. Fellowship (awarded yearly to approx. 50 PhD students worldwide)
- **March 2006:** the MonALISA project obtained the Innovation Award for High-Performance Applications from CENIC (Corporation for Education Network Initiatives in California)
- **May 2003:** first prize at the Students Scientific Session from the Politehnica University of Bucharest, in the Internet Systems and Applications section
- **July 2002 - October 2002:** grant from ADITEC (Advanced Information Technology Consortium, Romania) for software development in the Codestar project
- **1998 - 2003:** Merit and study scholarships at the Politehnica University of Bucharest

**PUBLICATIONS**

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**Selected papers:**

- *Adam2: reliable distribution estimation in decentralised environments.* Jan Sacha, Jeffrey Napper, Corina Stratan and Guillaume Pierre. To appear in 30th International Conference on Distributed Computing Systems (ICDCS 2010), Genoa Italy, June 2010.
- *A Performance Study of Grid Workflow Engines.* Corina Stratan, Alexandru Iosup and Dick H.J. Epema. 9th IEEE/ACM International Conference on Grid Computing (Grid 2008), Tsukuba, Japan, October 2008.
- *Dynamic Support for BPEL Process Instance Adaptation.* Ru Fang, Zhi Le Zou, Corina Stratan, Liana Fong, David Marston, Linh Lam and David Frank. 2008 IEEE International Conference on Services Computing (SCC 2008), Honolulu, Hawaii, USA, July 2008.
- *Realistic Simulation of Large Scale Distributed Systems Using Monitoring.* Ciprian Dobre, Corina Stratan and Valentin Cristea. 7th International Symposium on Parallel and Distributed Computing (ISPDC 2008), Krakow, Poland, July 2008.

- *A decentralized strategy for genetic scheduling in heterogeneous environments.* George Iordache, Simona Boboila, Florin Pop, Corina Stratan, Valentin Cristea. Multiagent and Grid Systems Journal (MAGS) 3(4), 2007.
- *Monitoring and Resource Usage Accounting in the Open Science Grid with the MonALISA Framework.* Corina Stratan, Alexandru Costan and Iosif Legrand. 16th International Conference on Control Systems and Computer Science, Bucharest, Romania, May 2007
- *Real-time Job Monitoring in Grid Environments Using MonALISA and ApMon.* Iosif Legrand, Corina Stratan, Catalin Cirstoiu, Mihaela Toarta, Costin Grigoras and Adrian Muraru. 15th International Conference on Control Systems and Computer Science, Bucharest, Romania, May 2005.
- *MONARC Simulation Framework.* Ciprian Dobre and Corina Stratan. RoEduNet International Conference, Timisoara, Romania, May 2004.
- *A Processes Oriented, Discrete Event Simulation Framework for Modelling and Design of Large Scale Distributed Systems.* Iosif C.Legrand, Harvey B. Newman, Frank van Lingen, Ciprian Dobre, Corina Stratan and Kathryn Paschen. IX International Workshop on Advanced Computing and Analysis Techniques in Physics Research, Tsukuba, Japan, 2003.

#### Under revision:

- *The XtreamOS Resource Selection Service.* Corina Stratan, Jan Sacha, Jeff Napper, Paolo Costa, Guillaume Pierre. ACM Transactions on Autonomous and Adaptive Systems (TAAS).

#### Books:

- *Large-Scale Distributed Computing and Applications. Models and Trends.* Valentin Cristea, Ciprian Dobre, Corina Stratan, Florin Pop, Alexandru Costan. IGI Global, 2010.
- *Data Structures and Algorithms - Applications in C++ using STL.* Valeriu Iorga, Cristian Opincaru, Corina Stratan, Paul Chirita. Polirom publishing house, 2005. *(in Romanian)*
- *C/C++ Programming Problems.* Valeriu Iorga, Paul Chirita, Corina Stratan, Cristian Opincaru. Niculescu publishing house, 2003. *(in Romanian)*

#### SKILLS

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- *Programming and workflow languages:* Java, C/C++, Python, WS-BPEL, Karajan, SQL, shell scripting
- *Distributed systems and Internet programming:* MPI, OpenMP, J2EE, HTML, web services (SOAP/WSDL), network programming (TCP/UDP)
- *Software Tools:* cloud platforms (OpenNebula, Amazon EC2), KVM, Xen, Apache Tomcat, Apache Axis, JBoss, Nginx, IBM WebSphere, ActiveBPEL
- *Other skills:* verbal communication (5+ years experience in working with students), technical writing, working well in teams
- *Languages:* Romanian (native), English (fluent), French (intermediate), Dutch (basic)