STEFANIA VICTORIA COSTACHE
Phone: +1 914 770 9589
Mail: stefania.costache@gmail.com

SUMMARY

I have 10 years of research experience in distributed systems and cloud system management and a deep understanding of the cloud software stack and the life-cycle of cloud-native applications. I am interested in understanding the characteristics of cloud applications, in particular data analytics and deep learning, and solving issues from running them on cloud and HPC systems, e.g., performance, cost-effective resource management, resilience.

EDUCATION

PhD in Computer Science **2010 – 2013**
University of Rennes 1, France
Funded by EDF (French Electricity Company)
Advisors: Christine Morin, Nikos Parlavantzas and Samuel Kortas
PhD Thesis title: “Market-based autonomous resource and application management in the cloud”

Master of Computer Science **2008 - 2010**
Automatic Control and Computers Faculty
University “Politehnica” of Bucharest, Romania
Specialization: System Software and Advanced System Applications

Bachelor of Engineering **2003 -2008**
Automatic Control and Computers Faculty
University “Politehnica” of Bucharest, Romania
Specialization: Computers

EXPERIENCE

IBM T.J.Watson Research Center, US **January 2016 - November 2018**
Research Staff - Container Cloud Platform

I investigated resource management issues for the container cloud platform to efficiently support heterogeneous applications, from micro-services to data analytics and deep learning. I experimented with container orchestration frameworks (Mesos, Kubernetes), prototyped custom controllers and schedulers, ran scalability experiments and looked in using machine learning for performance-resource estimations and scheduling.

Chalmers University of Technology, Sweden **September 2015 - December 2015**
Postdoctoral Researcher

I analysed the performance of stream processing frameworks (Spark and Flink) in the IoT context (intelligent vehicular systems).

Vrije University Amsterdam, The Netherlands **February 2014- August 2015**
Postdoctoral Researcher

I developed an online scheduler for many task-computing workflows, integrated with an elastic in-memory data storage, leading to increased scheduling performance and minimized resource waste. I also implemented simulations for multi-cloud provisioning policies and re-partitioning of virtual machines to optimize the cloud provisioning cost for heterogeneous workloads. In the same time, I collaborated with team members and students on several projects, including analysis of scalability of cloud stacks, algorithms for profiling the energy consumption and performance of many tasks computing applications and elastic in-memory data storage.

INRIA Rennes-Bretagne Atlantique, France **September 2013 - January 2014**
Research Engineer

I designed and ran scalability experiments for typical application deployment in a multi-cloud scenario using different cloud software stacks - *OpenNebula* and *OpenStack*, as part of an European funded project.

EDF R&D and INRIA Rennes-Bretagne Atlantique, France **May 2010 – July 2013**
Research Engineer

I developed a resource management framework for running HPC applications (batch MPI and task farming) on a private cloud using spot market and virtual economy concepts for prioritizing and scaling application resources. The framework was simulated and integrated with open source cloud management software. I proposed SLO-driven scaling policies for vertical (in terms of CPU and memory per virtual machine) and horizontal (in terms of number of virtual machines) resource allocation. Finally, I developed load balancing algorithms to provide placement of the virtual machines that enforces the computed allocations while keeping the number of virtual machine migrations below a threshold. Results were published in several top-tier conferences and journals.

INRIA Rennes-Bretagne Atlantique, France **May 2009 – October 2009**
Intern in the Myriads Group

I implemented a high availability framework for stateful distributed services in a dynamic distributed environment. I proposed a set of self-healing mechanisms to keep the availability of services while minimizing the number of replica instantiations that could happen due to nodes leaving or failing. I ran large scale evaluations on geographically distributed resources.

University of Groningen, The Netherlands ***February 2009- March 2009***
Intern in the Molecular Dynamics Group ***March 2008 – July 2008***

I implemented a parallelized version of efficient algorithms for molecular dynamics simulations at a hybrid (fine-grained and coarse-grained) scale in an open source software package. I ran large scale evaluations on a BlueGene/L system.

TEACHING EXPERIENCE

Vrije University Amsterdam, The Netherlands

- Lecturer for the Advanced Topics in Distributed Systems course, (2nd year master), Fall 2014
- Teaching Assistant for the Performance of Networked Systems course, (1st year master), Spring 2014, 2015

"Politehnica" University of Bucharest, Romania

- Computer Graphics (3rd year course), Fall 2008
- Graphic Processing Systems (4th year course), Fall 2008
- Operating Systems (3rd year course), Fall 2007

SKILLS

Programming Languages/Technologies: C, C++, Java, Golang, Python, Scala. Familiar with Ansible, MySQL, shell, Jupyter Notebook
Cloud Platform: Kubernetes, Mesos, Docker, Spark, Tensorflow. Familiar with IBM Cloud, Google Cloud, AWS, Microsoft Azure, OpenStack, NoSQL datastores, Flink, Hadoop, Caffe, Pytorch, AutoML

PUBLICATIONS

- *Resource Management in Cloud Platform as a Service Systems: Analysis and Opportunities.* Stefania Costache, Djawida Dib, Nikos Parlavantzas, Christine Morin. *Journal of Systems and Software*, Elsevier, 2017.
- *MemEFS: A network-aware elastic in-memory runtime distributed file system.* Alexandru Uta, Ove Danner, Cas van der Weegen, Ana-Maria Oprescu, Andreea Sandu, Stefania Costache, Thilo Kielmann. *Future Generation Computer Systems*, Elsevier, 2017

- *Market-based autonomous resource and application management in private clouds*. Stefania Costache, Samuel Kortas, Christine Morin, Nikos Parlavantzas. *Journal of Parallel and Distributed Computing*, 2016
- *Understanding the data-processing challenges in Intelligent Vehicular Systems*. Stefania Costache, Vincenzo Gulisano, Marina Papatriantafilou. *Intelligent Vehicles Symposium (IV), 2016 IEEE*, *pp. 611--618*
- *E-BaTS: Energy-Aware Scheduling for Bag-of-Task Applications in HPC Clusters. Alexandra Vintila-Filip, Ana-Maria Oprescu, Stefania Costache, Thilo Kielmann. Parallel Processing Letters 25(03), 1541005, World Scientific, 2015*
- *MemEFS: an elastic in-memory runtime file system for escience applications. Alexandru Uta, Andreea Sandu, Stefania Costache, Thilo Kielmann . e-Science 2015, pp. 465--474*
- *Scaling vm deployment in an open source cloud stack. Kaveh Razavi, Stefania Costache, Andrea Gardiman, Kees Verstoep, Thilo Kielmann . Proceedings of the 6th Workshop on Scientific Cloud Computing, pp. 3--10, 2015.*
- *Merkat: A Market-based SLO-driven Cloud Platform*. Stefania Victoria Costache; Nikos Parlavantzas; Christine Morin; Samuel Kortas. *CloudCom 2013,* Bristol, United Kingdom
- *On the Use of a Proportional-Share Market for Application SLO Support in Clouds*. Stefania Victoria Costache; Nikos Parlavantzas; Christine Morin; Samuel Kortas. *EuroPar2013,* Aachen, Germany (acceptance rate 26.8%)
- *Themis: Economy-Based Automatic Resource Scaling for Cloud Systems*. Stefania Victoria Costache; Nikos Parlavantzas; Christine Morin; Samuel Kortas. *HPCC 2012*, Liverpool, United Kingdom (acceptance rate 26.2%)
- *An Economic Approach for Application QoS Management in Clouds.* Stefania Victoria Costache; Nikos Parlavantzas; Christine Morin; Samuel Kortas, *VHPC 2011*, Bordeaux, France.
- *Semias: Self-Healing Active Replication on Top of a Structured Peer-to-Peer Overlay*. Stefania Costache, Thomas Ropars, Christine Morin, *SRDS 2010*, New Delhi, India (acceptance rate 21%)
- *Multiscaling Algorithms for Molecular Dynamics Simulations with GROMACS*. Nicolae Goga, Siewert Marrink, Stefania Victoria Costache, Florica Moldoveanu, IEEE International Systems Conference, 2009, Vancouver, Canada

ADDITIONAL ACTIVITIES

- Reviewer for International Journal of Transactions on Parallel and Distributed Systems since 2016
- External reviewer for the following conferences: IPDPS (2011, 2012), ISPDC (2011), Cluster (2011), CCGrid (2012, 2013) and the VTDC workshop (2012).

LANGUAGES

- English (fluent)
- French (intermediate)
- Romanian (native)