

Stefania Victoria Costache

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I am a computer engineer with a PhD in cloud resource optimization and distributed systems. I have a comprehensive understanding of distributed algorithms and cloud infrastructures and I am familiar with statistical modeling, machine learning, and data mining concepts. I have a proven track record of making significant and self-directed contributions to large and challenging projects. I am a strong supporter of Open Source technologies and Agile and DevOps methodologies.

Additional languages include French and Romanian.

Technical Proficiencies

Programming Languages/Technologies: C, Java, Golang, Python. *Familiar* with C++, Scala, Ansible, MySQL, Shell, & Jupyter Notebook.

Cloud Platform: Kubernetes, Mesos, Docker, Spark; *Familiar* with IBM Cloud, Google Cloud, AWS, Microsoft Azure, OpenStack, Hadoop, NoSQL Datastores, and Flink, Pytorch, Tensorflow.

Professional Experience

JP Morgan, London, UK

Software Engineer (September 2019 - current)

Data analytics in the context of a distributed platform used for risk calculations of financial assets.

- Used code instrumentation, statistics and visualization tools to provide insight and prediction of business usage and optimize the compute costs.

Self-employed, Sweden

(January 2019 - August 2019)

Projects related to Machine learning technologies on Cloud.

- Predicted performance using deep neural networks.
- Deployed a ML pipeline on Kubernetes and GCP
- Invited talk at Chalmers University of Technology, Sweden: "From Containers to AI in the Cloud: Experience with Resource Management"

IBM (T.J. Watson Research Center), New York, NY

Research Staff (January 2016 - November 2018)

Various tasks related to cloud compute resource optimization. Designed proof of concept prototypes, including custom controllers and schedulers, that were used to identify new technical challenges; these prototypes were adapted for internal business use.

- Increased efficiency of the cloud infrastructure for serverless data analytics and deep learning workloads by designing and implementing solutions that use spot market concepts to manage resources.
- Designed scalability experiments and experimented with container orchestration frameworks, such as Mesos and Kubernetes.
- Conducted Machine Learning investigations to estimate workload performance and scheduling requirements.

Chalmers University of Technology, Sweden

Postdoctoral Researcher (January 2016 - December 2016)

Utilized an intelligent vehicular systems (IoT) benchmark to investigate the performance of two well-known stream processing frameworks, Spark and Flink.

continued...

- Conducted an experimental case study that outlined the advantages and limitations of the two technology stacks.
- Published a poster showing the results at a specific international symposium.

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

Co-advised 3 graduate students and motivated them to successfully complete their projects by helping them brainstorm and draft research papers. Worked on several projects, including (1) the analysis of the scalability of cloud stacks, (2) the development of algorithms for profiling energy consumption; and (3) elasticity of an in-memory datastore for scientific data-intensive workflows.

- Increased scheduling performance and minimized resource waste by developing an online scheduler for scientific data-intensive workflows.
- Prototyped algorithms and implemented a multi-cloud provisioning policy simulator that revealed hosting cost reductions for PaaS providers.
- Co-authored several conference and journal papers.
- Strengthened student research capabilities by introducing them to different research papers and the methodology of research brainstorm during an advanced master course.

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

Conducted an experimental case study for an European-funded cloud middleware which interfaced with multiple infrastructure clouds and showed that typical application deployments have low performance overheads while also decreasing configuration overheads for users.

EDF R&D/INRIA Rennes-Bretagne Atlantique, France**Research Engineer** (May 2010 - July 2013)

Prioritized and scaled application resources by using spot market and virtual economy concepts to design a resource management framework for running HPC applications, such as batch MPI and task farming, on a private cloud.

- Maximized infrastructure utilization by proposing SLO-driven scaling policies for vertical and horizontal resource allocation; this proposal allowed more users to run applications simultaneously.
- Reduced the number of virtual machine migrations below a threshold and decreased resource management performance overheads by developing an incremental placement algorithm for virtual machines.
- Recognized by the French academic community for submitting the best paper on Cloud Computing at the 2014 annual CompAS meeting.

Internships

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

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

Education

Ph.D., Computer Science, 2013

University of Rennes 1, France

PhD Thesis title: "Market-based autonomous resource and application management in the cloud"

Master of Computer Science, Automatic Control and Computers Faculty, 2010
University "Politehnica" of Bucharest, Bucharest, Romania

Bachelor of Engineering, 2008
University "Politehnica" of Bucharest, Bucharest, Romania

Publications

1. Resource Management in Cloud Platform as a Service Systems: Analysis and Opportunities. Stefania Costache, Djawida Dib, Nikos Parlavantzias, Christine Morin. *Journal of Systems and Software*, Elsevier, 2017.
2. 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.
3. Market-based autonomous resource and application management in private clouds. Stefania Costache, Samuel Kortas, Christine Morin, Nikos Parlavantzias. *Journal of Parallel and Distributed Computing*, 2016.
4. Understanding the data-processing challenges in Intelligent Vehicular Systems. Stefania Costache, Vincenzo Gulisano, Marina Papatriantafylou. *Intelligent Vehicles Symposium (IV)*, 2016.
5. 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*, 2015.
6. MemEFS: an elastic in-memory runtime file system for escience applications. Alexandru Uta, Andreea Sandu, Stefania Costache, Thilo Kielmann. *e-Science*, 2015.
7. 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*, 2015.
8. Merkat: A Market-based SLO-driven Cloud Platform. Stefania Victoria Costache; Nikos Parlavantzias; Christine Morin; Samuel Kortas. *CloudCom*, 2013.
9. On the Use of a Proportional-Share Market for Application SLO Support in Clouds. Stefania Victoria Costache; Nikos Parlavantzias; Christine Morin; Samuel Kortas. *EuroPar*, 2013 (26.8%).
10. Themis: Economy-Based Automatic Resource Scaling for Cloud Systems. Stefania Victoria Costache; Nikos Parlavantzias; Christine Morin; Samuel Kortas. *HPCC*, 2012 (26.2%).
11. Semias: Self-Healing Active Replication on Top of a Structured Peer-to-Peer Overlay. Stefania Costache, Thomas Ropars, Christine Morin, *SRDS*, 2010 (21%).
12. Multiscaling Algorithms for Molecular Dynamics Simulations with GROMACS. Nicolae Goga, Siewert Marrink, Stefania Victoria Costache, Florica Moldoveanu, *IEEE International Systems Conference*, 2009.