Sebastien VARRETTE, PhD

Research Scientist
Management, Security and Performance of HPC systems

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Born on November 27th, 1979 (in France)
Married (2004), two children (2007,2010)

Short bio: Dr. Sebastien Varrette is Research Scientist within the Parallel Computing and Optimization Group (PCOG) group led by Prof. Pascal Bouvry at the University of Luxembourg.
Expert in the deployment and management of High Performance Computing (HPC) systems, he is leading since that time the development of the University's HPC platform, as well as the associated expert team of system administrators managing and supporting it.
His main research interests lie in the domains of the security and performance of parallel and distributed computing platforms, such as HPC or Cloud Computing infrastructures.

Technical / Management Expertise:	High Performance Computing (HPC) , Grid, Cluster & Cloud Platforms. I'm administrating cluster-based HPC systems since 2003 (Linux environment) **Leader of an expert team of HPC system administrator since 2008.**
Main research domains:	Security and Evaluation of Distributed Computing Platforms *Relevant contributions per domains*: Crash/cheating faults tolerance Code Obfuscation , CertiCloud, a Cloud IaaS secure platform Performance,Energy efficiency of HPC/Cloud platforms Developing security awareness by education

Education

2007	Ph.D. in Computer Science,	with honours (*Excellent/Outstanding*)
	University of Luxembourg (UL) & Institut National Polytechnique de Grenoble (INPG)	
	Thesis: *Security in Large Scale Distributed Systems: Authentication and Result Checking*	
2003	M.Sc. in Computer Science (Grenoble, France)	with honours (*TB/First Class*)
	Speciality: Cryptology, Security and Information Coding (CSCI),	rank: 1st
	Institut National Polytechnique de Grenoble (INPG) & University Joseph Fourier (UJF)	
2003	Master's Degree in Engineering (Telecoms ENSIMAG, Grenoble)	with honours (*B/2.1*)
	Speciality: Applied Mathematics, Computer Sciences & Telecommunications	rank: top 10%

Employment

2011 – now	Research Associate/Scientist (UL, Luxembourg)
2007 – 2010	Scientific collaborator (UL, Luxembourg)
2004 – 2007	Research Assistant (UL, Luxembourg)
2003	System administrator (ID-IMAG, Grenoble, France)

Awards

2018	IEEE ICoin 2018: Best Paper Award
2014	IEEE NSS 2014: Best Student Paper Award

Teaching Experience

2014 – now	UL HPC Schools	https://hpc.uni.lu/hpc-school/
2008 – now	Parallel & Grid Computing	Master MICS2 (UL)
2004 – 2007	Programming Techniques I	Bachelor I1/CUT1 (UL)
	Advanced Programming in C, C++ and Java	Bachelor I2 (UL)
	System Administration and Network Security	Master CSCI2 (UJF)
2006	Cryptology and Network Security	Master (Univ. of Yaoundé I, Cameroon)

Graduate Students Supervision

PostDocs.	Alban Rousset (2016 – 2018)	Large scale parallel simulation for Discrete Element Method
	Joseph Emeras (2014 – 2016)	Workload Analysis and Characterization of HPC Platforms for the Study of Virtualization Service
PhD.	Abdallah A.Z.A. Ibrahim (2017 – 2019)	Presence: Toward a Novel Approach for Performance Evaluation of Mobile Cloud SaaS Web Services
	Abdoul-Wahid C. Mainassara (2017 – 2019)	Large scale parallel simulation for Discrete Element Method
	Jakub Muszyński (2011 – 2015)	Cheating-Tolerance of Parallel and Distributed Evolutionary Algorithms in Desktop Grids and Volunteer Computing Systems
	Benoît Bertholon (2010 – 2013)	CertiCloud & JShadObf: Toward Integrity and Software Protection in Cloud Computing Platforms
In addition:	13 master and 4 bachelor students supervision for their last year project and training.	

Research Projects

2007 – now	UL High Performance Computing (HPC), co-PI (UL cumulative contribution: **10,436,151 €**)
2014 – 2018	EU COST Action IC1305: Network for Sustainable Ultrascale Computing (NESUS)
2016 – 2019	co-PI, UL Lsdem (UL contribution: 332 k€)
2014 – 2016	AFR PostDoc J. Emeras (Evalix; Co-Supervisor; Total/AFR contribution: 56 k€) Workload Analysis & Characterization of HPC Platforms for the Study of Virtualization Service
2011 – 2013	UL EvoPerf (UL contribution: 373 k€)
2010 – 2012	FNR CORE GreenIT (Total: 1,5 M€, FNR contribution: 432 k€)
2010 – 2012	AFR PhD B. Bertholon (PHD-09-142; Scientific Advisor; Total/AFR contribution: 110 k€) Confidentiality and Integrity Issues over Cloud Computing Platforms
2009 – 2013	EU COST Action IC0804: Energy efficiency in large scale distributed systems
2009 – 2013	EU CoreGrid
2006 – 2008	ANR SafeScale-BGPR (ANR-05-SSIA-0005; ANR contribution: 68 k€)
2005 – now	Grid'5000 (technical committee)
2005 – 2007	FNR-SECOM TeseGrad (FNR contribution: 300 k€)
2004 – 2007	CryptAlpes
2004 – 2006	RagTime (Total: 545 k€, Rhône-Alpes Region contribution: 217 k€)

Professional Development

IEEE Computer and Computational Intelligence society member

Junior *Autorisation à Diriger des Recherches* (ADR) granted on July, 2015

Various editorial responsibilities

- Reviewer for International Projects: National Science Center (Poland)
- Reviewer for several journals and international (IEEE, ACM) conferences
- Member of several international Technical Program Committee,
- Organizer of various conferences, either as general, program or track chair

2018 – now	National ICT standardization delegate: ISO/TC 307: Blockchain and DLTs
2017 – now	Management committee member: **advisor representing Luxembourg within PRACE**
2016 – now	Management committee member: ETP4HPC
2016	**General Chair**, 8th IEEE Intl. Conf. Cloud Computing Technology & Science (CloudCom'16)
2009 – now	Technical advisor for LCSB and the MECO Ministry on HPC projects
2007 – now	UL HPC Manager.

Cumulative Project Investment: 10,436,151 € (as of 2018).

- 662 computing nodes, 10132 cores, $R_{\text{peak}} = 346.652$ TFlops
- 201 servers (74,6% are Xen/KVM VMs)
- NFS, GPFS/Spectrumscale, Lustre Storage (Total capacity: 9232.4 TB)
- Management of a team of 5 expert system administrators

2007 – now	Manager of various IT services (Gitlab @ Uni.lu, Gforge @ Uni.lu...)
2006	EGIDE mission for 3 weeks in Cameroon (master lecture – Univ. of Yaoudé I)
2005	Editorial Committee for the definition of new UL master and bachelor degrees
2005 – 2006	Editorial Committee, UL website (CMS selection & management)
2005 – 2006	Faculty Council, elected member (assistant representative)
2000 – 2002	Ensimag Junior Enterprise, developer member

Publications

Publication category	Quantity
PhD Thesis	1
Books	5
Magazine	1
Book Chapters	9
International journals	7
International conferences with proceedings and reviews	45
(French) national conferences with proceedings and reviews	4
International conferences with proceedings	1
International conferences with reviews	7
Masters Thesis	1
Technical Reports	8
Miscellaneous	1
Total:	**90**

Publish or Perish	Papers:121 Cites/paper: 4.41	Citations:534,Years:15 Cites/author: 166.46	**h-index:12**,g-index:20 Papers/author: 43.62	Cites/year: 35.60 Query date: **2018-04-07**
DBLP	Google Scholar			

Selected Publications

[1] J.-G. Dumas, P. Lafourcade, A. Tichit, and S. Varrette. *Les blockchains en 50 questions: comprendre le fonctionnement et les enjeux de cette technologie innovante*. Collection Sciences Sup. Dunod, 1er edition, Juin 2018. 224 pages, in French.

[2] J.-G. Dumas, J.-L. Roch, E. Tannier, and S. Varrette. *Foundations of Coding: Compression, Encryption, Error-Correction*. Wiley & Sons, February 2015. 376 pages.

[3] P. Bouvry, R. Mayer, J. Muszyński, D. Petcu, A. Rauber, G. Tempesti, T. Trinh, and S. Varrette. Resilience within Ultrascale Computing System: Challenges and Opportunities from Nesus Project. *Intl. J. on Supercomputing Frontiers and Innovations*, 2(2):46–63, 2015.

[4] M. Guzek, S. Varrette, V. Plugaru, J. E. Pecero, and P. Bouvry. A Holistic Model of the Performance and the Energy-Efficiency of Hypervisors in an HPC Environment. *Intl. J. on Concurrency and Computation: Practice and Experience (CCPE)*, 26(15):2569–2590, October 2014.

[5] J. Muszyński, S. Varrette, P. Bouvry, F. Seredyński, and S. U. Khan. Convergence Analysis of Evolutionary Algorithms in the Presence of Crash-Faults and Cheaters. *Intl. Journal. of Computers and Mathematics with Applications (CAMWA)*, 64(12):3805–3819, December 2012.

[6] A. A.Z.A. Ibrahim, S. Varrette, and P. Bouvry. PRESENCE: Toward a Novel Approach for Performance Evaluation of Mobile Cloud SaaS Web Services . In *Proc. of the 32nd IEEE Intl. Conf. on Information Networking (ICOIN 2018)*, Chiang Mai, Thailand, January 2018. IEEE Computer Society. **Best Paper Award**.

[7] J. Emeras, S. Varrette, and P. Bouvry. Amazon Elastic Compute Cloud (EC2) vs. in-House HPC Platform: a Cost Analysis. In *Proc. of the 9th IEEE Intl. Conf. on Cloud Computing (CLOUD 2016)*, San Francisco, USA, June 2016. IEEE Computer Society.

[8] V. Plugaru, S. Varrette, and P. Bouvry. Performance Analysis of Cloud Environments on Top of Energy-Efficient Platforms Featuring Low Power Processors. In *Proc. of the 6th IEEE Intl. Conf. on Cloud Computing Technology and Science (CloudCom'14)*, Singapore, December 2014. IEEE Computer Society.

[9] J. Muszyński, S. Varrette, J.L. Jiménez Laredo, and P. Bouvry. Exploiting the Hard-wired Vulnerabilities of Newscast via Connectivity-splitting Attack. In *Proc. of the IEEE Intl. Conf. on Network and System Security (NSS 2014)*, volume 8792 of *LNCS*, pages 152–165, Xi'an, China, October 2014. Springer Verlag. **Best Student Paper Award**.

[10] J. Muszynski, S. Varrette, and P. Bouvry. Expected Running Time of Parallel Evolutionary Algorithms on Unimodal Pseudo-Boolean Functions over Small-World Networks. In *Proc. of the IEEE Congress on Evolutionary Computation (CEC'2013)*, Cancún, Mexico, June 2013. IEEE.

[11] B. Bertholon, S. Varrette, and P. Bouvry. CertiCloud: a Novel TPM-based Approach to Ensure Cloud IaaS Security. In *Proc. of the 4th IEEE Intl. Conf. on Cloud Computing (CLOUD 2011)*, Washington DC, USA, July 2011. IEEE Computer Society.