

# 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 an experienced 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.

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TECHNICAL / MANAGEMENT EXPERTISE:	High Performance Computing (HPC) , Grid, Cluster & Cloud Platforms. I'm administrating cluster-based HPC systems since 2003 (Linux environment) <b>Leader of an expert team of HPC system administrator since 2008.</b>
MAIN RESEARCH DOMAINS:	Security and Evaluation of Distributed Computing Platforms

## Education

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2007	PH.D. IN COMPUTER SCIENCE, with honours ( <i>Excellent/Outstanding</i> ) University of Luxembourg (UL) & Institut National Polytechnique de Grenoble (INPG) Thesis: <i>Security in Large Scale Distributed Systems: Authentication and Result Checking</i>
2003	M.SC. IN COMPUTER SCIENCE (Univ. de Grenoble, France) with honours ( <i>TB/First Class</i> ) Speciality: Cryptology, Security and Information Coding (CSCI), rank: 1st
2003	MASTER'S DEGREE IN ENGINEERING (Telecoms ENSIMAG, Grenoble) with honours ( <i>B/2.1</i> ) Speciality: Applied Mathematics, Computer Sciences & Telecommunications rank: top 10%

## Employment

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2007 – now	RESEARCH SCIENTIST (UL, Luxembourg)
2004 – 2007	RESEARCH ASSISTANT (UL, Luxembourg)
2003	SYSTEM ADMINISTRATOR (ID-IMAG, Grenoble, France)

## Awards

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

## Teaching Experience

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2014 – now	UL HPC SCHOOLS	<a href="https://hpc.uni.lu/hpc-school/">https://hpc.uni.lu/hpc-school/</a>
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)

## Participation to Ph.D Boards

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Oct. 2016	ALBAN ROUSSET, Institut FEMTO-ST, Université de Franche-Comté. <i>Contribution à la distribution et à la synchronisation des Systèmes Multi-Agents sur les super-calculateurs</i> , Examinateur
Sept. 2018	GABRIELE POZZETTI, University of Luxembourg <i>A dual-grid multiscale approach to CFD-DEM couplings for multiphase flow</i> , Jury member
Dec. 2018	DAVID GUYON, University of Rennes I <i>Energy-efficient Cloud Elasticity for Data-driven Applications</i> (pending exact title), Jury Member

## Graduate Students Supervision

<b>PostDocs.</b>	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
<b>PhD.</b>	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 CHAO LIU (2017 – 2019) Pricing strategies for cloud brokers at the Software-as-a-Service (SaaS) level 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
<i>In addition:</i>	13 master and 5 bachelor students supervision for their last year project and training.

## Research Projects

2007 – now	<a href="#">UL High Performance Computing (HPC)</a> , co-PI (UL cumulative contribution: <b>20,586,151 €</b> )
2019 - 2022	EU H2020 PRACE 6th Implementation Phase Project (PRACE-6IP)
2014 – 2018	EU <a href="#">COST ACTION IC1305</a> : 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 <a href="#">GREENIT</a> (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 <a href="#">COST ACTION IC0804</a> : Energy efficiency in large scale distributed systems
2009 – 2013	EU <a href="#">COREGRID</a>
2006 – 2008	ANR <a href="#">SAFESCALE-BGPR</a> (ANR-05-SSIA-0005; ANR contribution: 68 k€)
2005 – now	<a href="#">GRID'5000</a> (technical committee)
2005 – 2007	FNR-SECOM TESEGRAD (FNR contribution: 300 k€)
2004 – 2007	<a href="#">CRYPTALPES</a>
2004 – 2006	<a href="#">RAGTIME</a> (Total: 545 k€, Rhône-Alpes Region contribution: 217 k€)

## Professional Development

	IEEE Computer and Computational Intelligence society member Junior <i>Autorisation à Diriger des Recherches</i> (ADR) granted on July, 2015 <b>Various editorial responsibilities</b> 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 <i>general</i> , <i>program</i> or <i>track</i> chair
2018 – now	National ICT standardization delegate: <a href="#">ISO/TC 307: Blockchain and DLTs</a>
2017 – now	HPC Management committee member: <b>advisor representing Luxembourg within PRACE</b> (Partnership for Advanced Computing in Europe)
2016 – now	Management committee member: <a href="#">ETP4HPC</a>
2016	<b>General Chair</b> , 8th IEEE Intl. Conf. Cloud Computing Technology & Science ( <a href="#">CloudCom'16</a> )
2009 – 2018	Delegate representing Luxembourg in EU COST Actions <a href="#">IC1305</a> and <a href="#">IC0804</a>
2009 – now	TECHNICAL ADVISOR for Luxembourg' <a href="#">MECO</a> and <a href="#">SMC</a> Ministries on HPC projects
<b>2007 – now</b>	<b><a href="#">UL HPC Manager and Team leader</a>.</b> <b>Cumulative Project Investment: 20,586,151 €</b> (as of 2018). 684 computing nodes, 11084 cores, 122GPU accelerators, $R_{\text{peak}} = 1038.302$ TFlops 201 servers (74,6% are Xen/KVM VMs) NFS, GPFS/Spectrumscale, Lustre Storage (Total capacity: 9852.4 TB) Management of the expert IT team sustaining the facility
2007 – now	Manager of various IT services ( <a href="#">Gitlab @ Uni.lu</a> , <a href="#">Gforge @ Uni.lu...</a> )
2006	<a href="#">EGIDE</a> mission for 3 weeks in Cameroon (master lecture – Univ. of Yaoundé I)

## Publications

Publication category	Quantity
Books	6
Magazine	1
Book Chapters	11
Edited Books / Proceedings	1
International journals	8
International conferences with proceedings and reviews	49
(French) national conferences with proceedings and reviews	4
International conferences with reviews (no proceedings)	7
PhD Thesis	1
Masters Thesis	1
Technical Reports and Presentations	37
Miscellaneous / Poster	1
<b>Total:</b>	<b>127</b>

<a href="#">Publish or Perish</a>	Papers:121	Citations:534,Years:15	<b>h-index:12</b> ,g-index:20	Cites/year: 35.60
<a href="#">Orbi<sup>lu</sup></a>	Cites/paper: 4.41	Cites/author: 166.46	Papers/author: 43.62	Query date: <b>2018-04-07</b>
	<a href="#">DBLP</a>	<a href="#">Google Scholar</a>		

## 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*. Dunod, 1er edition, September 2018. 296 pages, in French.
- [2] J.-G. Dumas, J.-L. Roch, E. Tannier, and S. Varrette. *Théorie des Codes : Compression, Cryptage et Correction*. Collection Sciences Sup. Dunod, 3rd edition, August 2018. 384 pages, in French.
- [3] J.-G. Dumas, J.-L. Roch, E. Tannier, and S. Varrette. *Foundations of Coding: Compression, Encryption, Error-Correction*. Wiley & Sons, February 2015. 376 pages.
- [4] A. A. Z. A. Ibrahim, M. U. Wasim, S. Varrette, and Pascal Bouvry. PRESENCE: Monitoring and Modelling the Performance Metrics of Mobile Cloud SaaS Web Services. *J. Mobile Information Systems*, 2018(1351386), August 2018. Extended journal version of our IEEE ICoIn 2018 paper.
- [5] 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.
- [6] 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.
- [7] 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**.
- [8] 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.
- [9] 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.
- [10] 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**.
- [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.