Sebastien VARRETTE, PhD

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Research Scientist, Deputy Head HPC for Research
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: With more than 12 years of postdoctoral and team management experience, Dr. Varrette is Research Scientist within the University of Luxembourg. Expert in the deployment and management of High Performance Computing (HPC) systems, he is leading with Prof. Pascal Bouvry the development of the University's HPC and Big Data platform, as well as the associated core expert team managing and supporting it.

In parallel, he is pursuing his research in the domains of the security and performance of parallel and distributed computing platforms, such as HPC, Cloud Computing or Data Analytics infrastructures. His research contributions led to more than 80 publications in high-level scientific journals, or international conference proceedings while co-authoring 4 books. He has a strong involvement in the community with reviewing roles in impact journals, conferences organization (e.g., IEEE CloudCom) and the participation to more than 50 conference program committee.

Finally, he takes part for the management committee and represents Luxembourg within multiple EU HPC projects, such as PRACE (acting Advisor), ETP4HPC or several COST actions. He has also concrete contributions in several strategic projects linked to HPC developed with multiple key decision makers in the Luxembourg context, either from the private sector or at the governmental level. He's also acting as HPC expert for the European Commission in the Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI) program.

TECHNICAL / MANAGEMENT EXPERTISE:	High Performance Computing (HPC), Big Data (BD) & Cloud technologies. Managing cluster-based HPC systems since 2003 (Linux environment) **HPC Team Leader since 2007** (Deputy head, HPC for Research)
MAIN RESEARCH DOMAINS:	Security and Evaluation of Distributed Computing Platforms

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 (Univ. de Grenoble, France) with honours (*TB/First Class*) Speciality: Cryptology, Security and Information Coding (CSCI), rank: 1st
2003	MASTER'S DEGREE IN ENGINEERING (Telecoms ENSIMAG, Grenoble) with honours (*B/2.1*) Speciality: Applied Mathematics, Computer Sciences & Telecommunications rank: top 10%

Employment

2007 – now	RESEARCH SCIENTIST (UL, Luxembourg)
2004 – 2007	RESEARCH ASSISTANT (UL, Luxembourg)
2003	IT (LAB) AND HPC SYSTEM MANAGER (ID-IMAG, Grenoble, France),

Awards

2018	Best Paper Award, 32th IEEE Intl. Conf. on Information Networking (ICoin 2018)
2014	Best Student Paper Award, 8th IEEE Intl. Conf. on Network & System Security (NSS 2014)

Teaching Experience

2019	DATA SCIENCES TRAINING FOR EUROPEAN COMMISSION EMPLOYEES (Digital Pole)	
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 – 2020) 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
In addition:	19 master and 5 bachelor students supervision for their last year project and training.
	Team leader (deputy head), Core management team of the Uni.lu HPC facility (Total: 8 FTEs).

Research Projects

2007 – now	UL High Performance Computing (HPC), co-PI (UL cumulative contribution: **20,586,151 €**)
2019 - 2022	EU H2020 PRACE 6th Implementation Phase Project (PRACE-6IP)
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, EU COREGRID
Before 2008	ANR SAFESCALE-BGPR, GRID'5000 (technical committee), FNR-SECOM TESEGRAD, CRYPTALPES, RAGTIME etc.

Professional Development and Recognitions

	IEEE Computer and Computational Intelligence society member
	Autorisation à Diriger des Recherches (ADR), 2019
	Participation to Ph.D Boards: A. Rousset (2016), G. Pozetti (2018), D. Guyon (2018)
	Various editorial responsibilities
	Reviewer for International Projects: National Science Center (Poland)
	Reviewer for several impact journals and international (IEEE, ACM) conferences
	Member of more than 50 international Technical Program Committee,
	Organizer of various conferences, either as *general*, *program* or *track* chair
	UL HPC Manager (Deputy head) and Team leader since 2007.
	Cumulative Project Investment: 20,586,151 € (as of 2019).
	690 computing nodes, 11252 cores, 146GPU accelerators, $R_{\text{peak}} = 1263.322$ **TFlops**
	201 servers (74,6% are Xen/KVM VMs)
	Shared Storage capacity: **9852.4 TB**, over NFS, GPFS/Spectrumscale, Lustre File Systems
	Core HPC Management team: 8 FTEs
2019	**EC HPC expert**, Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI) program
2019 – now	**Advisory board member**, Luxembourg Joint Artificial Intelligence (AI) Lab with NVidia
2017 – now	**PRACE Management committee**: Luxembourg representative (acting ***advisor***)
	Partnership for Advanced Computing in Europe
2016 – now	Management committee member within ETP4HPC
	European Technology Platform (ETP) in the area of High-Performance Computing (HPC)
2018 – now	National ICT standardization delegate: ISO/TC 307: Blockchain and DLTs
2016	**General Chair**, 8th IEEE Intl. Conf. Cloud Computing Technology & Science (CloudCom'16)
2009 – 2018	Delegate representing Luxembourg in EU COST Actions IC1305 and IC0804
2009 – now	**HPC Technical advisor** for Luxembourg' MECO and SMC Ministries on HPC projects
2007 – now	Manager of various complementary Research Computing / IT services
2006	EGIDE mission for 3 weeks in Cameroon (master lecture – Univ. of Yaoudé 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
Total:	**127**

Publish or Perish	Papers:165	Citations:707,Years:15	**h-index:12**,g-index:23	Cites/year: 44.19
	Cites/paper: 4.28	Cites/author: 166.46	Papers/author: 43.62	Query date: **2019-08-02**
Orbi^{lu}	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.* 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] S. Varrette and N. Bernard. *Programmation avancée en C (avec exercices et corrigés).* Collection Informatique et Systèmes d'Informations. Hermès, Fev. 2007. 416 pages, in French.

[5] 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.

[6] 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.

[7] 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.

[8] 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**.

[9] 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.

[10] 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.

[11] 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**.

[12] 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.