

# Sebastien VARRETTE, PhD

Research Scientist, Head UL HPC & Big Data Facility  
Management, Security and Performance of HPC systems

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GPG Key ID: [5D08BCDD4F156AD7](#)



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

*Short bio:* With more than 14 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 the University's HPC and Big Data platform, and the associated expert team managing and supporting this facility.

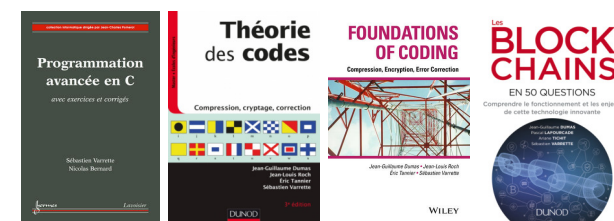
In parallel, he is pursuing his research in the domains of the security and performance of parallel and distributed computing platforms, such as HPC, Cloud Computing or Data Analytics infrastructures. His research contributions led to more than 80 publications in high-level scientific journals, or international 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), [CASTIEL](#), [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 (Ex: EuroHPC MeluXina Supercomputer). 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 large-scale HPC and Data analytics systems since 2003 (Linux environment)  
**HPC Team Leader since 2007** (Head, Uni.lu HPC facility)

MAIN RESEARCH DOMAINS:  
BOOKS [4, 3, 2, 1]:



## Education

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

## Awards

2018	Best Paper Award, 32 <sup>th</sup> IEEE Intl. Conf. on Information Networking (ICoin 2018)
2014	Best Student Paper Award, 8 <sup>th</sup> 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	<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 ( <a href="#">Univ. of Yaoundé I</a> , Cameroon)

## Graduate Students Supervision

<b>PostDocs.</b>	EZHILMATHI KRISHNASAMY (2019 –) EMMANUEL KIEFFER (2019 –) ALBAN ROUSSET (2016 – 2018) JOSEPH EMERAS (2014 – 2016)	PRACE-6IP project coordination, advanced HPC/research support Bi-level optimization and scalable science Large scale parallel simulation for Discrete Element Method Workload Analysis and Characterization of HPC Platforms for the Study of Virtualization Service
<b>PhD.</b>	LUDOVICA PASERI (2019 –) ABDALLAH A.Z.A. IBRAHIM (2017 – 2020) ABDOUL-WAHID C. MAINASSARA (2017 – 2020) CHAO LIU (2017 –) JAKUB MUSZYŃSKI (2011 – 2015) BENOÎT BERTHOLON (2010 – 2013)	GDPR compliance in Eurorean HPC and Cloud Computing Initiatives PRESENCE: Toward a Novel Approach for Performance Evaluation of Mobile Cloud SaaS Web Services Large scale parallel simulation for Discrete Element Method Pricing strategies for cloud brokers at the Software-as-a-Service (SaaS) level Cheating-Tolerance of Parallel and Distributed Evolutionary Algorithms in Desktop Grids and Volunteer Computing Systems CertiCloud & JShadObf: Toward Integrity and Software Protection in Cloud Computing Platforms
<i>In addition:</i>	22 master and 5 bachelor students supervision for their last year project and training. Team leader, Core management team of the Uni.lu HPC facility.	

## Research Projects

2007 – now	UL High Performance Computing (HPC), co-PI (UL cumulative contribution: <b>23,586,151 €</b> )
2019 - 2022	EU H2020 PRACE 6th Implementation Phase Project (PRACE-6IP)
2014 – 2018	EU <b>COST ACTION IC1305</b> : 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 <b>GREENIT</b> (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 <b>COST ACTION IC0804</b> : Energy efficiency in large scale distributed systems, EU <b>COREGRID</b>
Before 2008	ANR <b>SAFESCALE-BGPR</b> , <b>GRID'5000</b> (technical committee), FNR-SECOM TESEGRAD, <b>CRYPTALPES</b> , <b>RAGTIME</b> etc.

## Professional Development and Recognitions

	IEEE Computer and Computational Intelligence society member <i>Autorisation à Diriger des Recherches</i> (ADR), 2019 Participation to Ph.D Boards: A. Rousset (2016), G. Pozetti (2018), D. Guyon (2018)
	<b>Various editorial responsibilities</b> 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 <i>general</i> , <i>program</i> or <i>track</i> chair
	<b>Uni.lu High Performance Computing (HPC) Manager and Team leader</b> since 2007. Cumulated Facility Capacity: $R_{\text{peak}} = 2794.23 \text{ TFlops}$ , Shared Storage capacity: <b>10713.4 TB</b>
2020 –	<b>EU CASTIEL HPC Champion</b> Luxembourg, Training, Twinning, Mentoring
2019 – 2020	<b>EC HPC expert</b> , Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI) program
2019 – now	<b>NVAITC Advisory board member</b> , Luxembourg NVidia Artificial Intelligence (AI) Technology Center
2017 – now	<b>PRACE Management committee</b> : Luxembourg representative (acting <i>advisor</i> ) Partnership for Advanced Computing in Europe
2016 – now	Management committee member within <b>ETP4HPC</b> European Technology Platform (ETP) in the area of High-Performance Computing (HPC)
2018 – 2020	National ICT standardization delegate: <b>ISO/TC 307: Blockchain and DLTs</b>
2016	<b>General Chair</b> , 8th IEEE Intl. Conf. Cloud Computing Technology & Science ( <b>CloudCom'16</b> )
2009 – 2018	Delegate representing Luxembourg in EU COST Actions <b>IC1305</b> and <b>IC0804</b>
2009 – 2020	<b>HPC Technical advisor</b> for Luxembourg' <b>MECO</b> and <b>SMC</b> Ministries on HPC projects
2007 – now	Manager of various complementary Research Computing / IT services
2006	<b>EGIDE</b> mission for 3 weeks in Cameroon (master lecture – Univ. of Yaoundé I)

## Publications

Publication category	Quantity
Books	7
Magazine	1
Book Chapters	12
Edited Books / Proceedings	1
International journals	9
International conferences with proceedings and reviews	54
(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	44
Miscellaneous / Poster	1
<b>Total:</b>	<b>142</b>

<a href="#">Publish or Perish</a>	Papers:186	Citations:984, Years:18	<b>h-index:13</b>	g-index:28
<a href="#">Orbi<sup>1u</sup></a>	Cites/year: 54.67	Cites/paper: 5.29	Authors/paper: 3.79	Query date: <b>2021-07-27</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, 2nd edition, November 2019. 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] J. Emeras, S. Varrette, V. Plugaru, and P. Bouvry. Amazon elastic compute cloud (ec2) versus in-house hpc platform: A cost analysis. *IEEE Trans. Cloud Computing*, 7(2):456–468, April 2019.
- [6] 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 IEEE ICoIN 2018 best paper paper.
- [7] 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.
- [8] 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.
- [9] S. Varrette, E. Kieffer, F. Pinel, E. Krishnasamy, S. Peter, H. Cartiaux, and X. Besseron. RESIF 3.0: Toward a Flexible & Automated Management of User Software Environment on HPC facility. In *ACM Practice and Experience in Advanced Research Computing (PEARC'21)*, Virtual Event, July 2021. Association for Computing Machinery (ACM).
- [10] L. Paseri, S. Varrette, and P. Bouvry. Protection of Personal Data in High Performance Computing Platform for Scientific Research Purposes. In *Proc. of the EU Annual Privacy Forum (APF) 2021*, volume 12703 of *Lecture Notes in Computer Science (LNCS)*, pages 123–142, Online Event, June 2021. Springer International Publishing.
- [11] S. Mahon, S. Varrette, V. Plugaru, F. Pinel, and P. Bouvry. Performance Analysis of Distributed and Scalable Deep Learning. In *20th IEEE/ACM Intl. Symp. on Cluster, Cloud and Internet Computing (CCGrid'20)*, pages 760–766, Melbourne, Australia, May 2020. IEEE/ACM.
- [12] S. Varrette, F. Pinel, E. Kieffer, G. Danoy, and P. Bouvry. Automatic Software Tuning of Parallel Programs for Energy-Aware Executions. In *Proc. of 13th Intl. Conf. on Parallel Processing and Applied Mathematics (PPAM 2019)*, LNCS, Bialystok, Poland, 2019. Springer Verlag. Publication expected to appear in 2020.
- [13] 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)*, pages 50–55, Chiang Mai, Thailand, January 2018. IEEE Computer Society. **Best Paper Award**.
- [14] 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**.
- [15] 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.