Sebastien VARRETTE, PhD

Research Scientist, Head Research Computing and HPC operations
Management, Security and Performance of HPC systems

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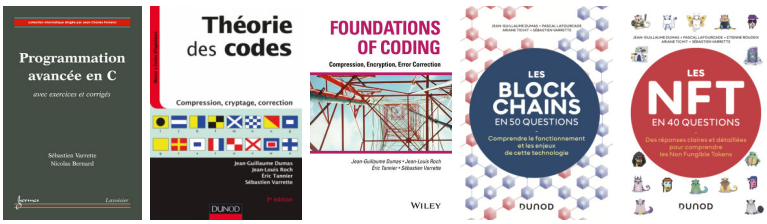
Born on November 27th, 1979 (in France)
Married (2004), two children (2007,2010)

Short bio: With more than 15 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 100 publications in high-level scientific journals, or international conference proceedings while co-authoring 5 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:	Security and Performance Evaluation of Distributed Computing Platforms
Books [5, 4, 3, 2, 1]:	

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%

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

2021	Trusted Computing paradigms and Distributed Ledger Technologies MTECH (UL)	
2019	Data Sciences Training for European Commission employees (Digital Pole)	
2014 – now	Uni.lu High Performance Computing (ULHPC) Schools https://ulhpc-tutorials.rtfd.io	
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.	Ezhilmathi Krishnasamy (2019 – 2021)	PRACE-6IP project coordination, advanced HPC/research support
	Emmanuel Kieffer (2019 – 2020)	Bi-level optimization and scalable science
	Alban Rousset (2016 – 2018)	Large scale parallel simulation for Discrete Element Method
	Joseph Emeras (2014 – 2016)	Workload Analysis & Characterization of HPC Platforms
PhD.	Ludovica Paseri (2019 –)	GDPR compliance in Eurorean HPC and Cloud Computing Initiatives
	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 – 2020)	Large scale parallel simulation for Discrete Element Method
	Chao Liu (2017 –)	Pricing strategies for cloud brokers at the Software-as-a-Service (SaaS) level
	Jakub Muszyński (2011 – 2015)	Cheating-Tolerance of Parallel & Distributed Evolutionary Algorithms in Desktop Grids and Volunteer Computing Systems
	Benoît Bertholon (2010 – 2013)	CertiCloud & JShadObf: Toward Integrity & Software Protection in Cloud Computing Platforms
In addition:	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: **23,586,151 €**)
2019 – 2022	EU H2020 PRACE 6th Implementation Phase Project (PRACE-6IP)
2016 – 2019	UL LSDEM (Large scale parallel Discrete Element Simulation), co-PI (UL contribution: 332 k€)
2014 – 2018	EU COST Action IC1305 Network for Sustainable Ultrascale Computing (NESUS)
2014 – 2016	AFR PostDoc J. Emeras (Evalix; Co-Supervisor; Total/AFR contribution: 56 k€)
Before 2013	EU COST Action IC0804 Energy efficiency in large scale distributed systems
	FNR CORE GreenIT, SECOM, TESEGRAD, AFR PhD B. Bertholon, UL EvoPerf
	ANR SafeScale-BGPR, Grid'5000 (technical committee), 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

Uni.lu High Performance Computing (HPC) Manager and Team leader since 2007.
- Cumulated Facility Capacity: $R_{\mathbf{peak}} = 2794.23$ **TFlops**, Shared Storage capacity: **10713.4 TB**

EU RFP Tender Management:
- 2019-2021: Aion supercomputer (RFP 190027, Atos/DDN, Budget: **3,5M€**)
- 2017-2018: Iris supercomputer (RFP 160019,160020,170035,180027, Dell/DDN, Budget: n/a),
- 2014: Uni.lu Scaled NAS (RFP 140002, Dell/EMC, Budget: n/a),
- 2011: Gaia supercomputer (RFP 110004, Bull/NexSan, Budget: n/a),

2020 –	**EU CASTIEL HPC Champion** Luxembourg, Training, Twinning, Mentoring
2019 – 2020	**EC HPC expert**, Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI) program
2019 – now	**H2020 PRACE-6IP** (Implementation Phase) **Management board member**, Luxembourg
2019 – 2020	EuroHPC MeluXina Supercomputer Project Consortium (Technical Advisor)
2019 – now	Luxembourg **NVAITC** (NVidia Artificial Intelligence (AI) Tech. Center) **Advisory board member**
2018 – now	Uni.lu IT Advising Committee (ITAC) member
2017 – now	**PRACE** (Partnership for Advanced Computing in Europe) **Management committee** (Advisor)
2016 – now	ETP4HPC (European Technology Platform (ETP) in the area of HPC) Management committee member
2018 – 2020	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 – 2020	**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	9
Magazine	1
Book Chapters	12
Edited Books / Proceedings	1
International journals	9
International conferences with proceedings and reviews	59
(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	45
Miscellaneous / Poster	1
Total:	**150**

Publish or Perish	Papers:188 Cites/year: 55.84	Citations:1061,Years:18 Cites/paper: 5.64	**h-index:14** Authors/paper: 3.82	g-index:29 Query date: **2022-02-01**
Orbi[lu]	DBLP	Google Scholar		

Selected Publications

[1] J.-G. Dumas, P. Lafourcade, E. Roudeix, A. Tichit, and S. Varrette. *Les NFT en 40 questions: Des réponses claires et détaillées pour comprendre les Non Fungible Tokens*. Hors collection. Dunod, 1er edition, Fev 2022. 256 pages, in French.

[2] 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*. Hors collection. Dunod, 2eme edition, Fev 2022. 304 pages, in French.

[3] 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.

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

[5] 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.

[6] 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.

[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, H. Cartiaux, S. Peter, E. Kieffer, T. Valette, and A. Olloh. Management of an Academic HPC & Research Computing Facility: The ULHPC Experience 2.0. In *Proc. of the 6th ACM High Performance Computing and Cluster Technologies Conf. (HPCCT 2022)*, Fuzhou, China, July 2022. Association for Computing Machinery (ACM).

[10] 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).

[11] 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.

[12] 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.

[13] 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.

[14] 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**.

[15] 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**.