

Sebastien VARRETTE, PhD

Research Scientist, Head Research Computing and HPC operations
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.

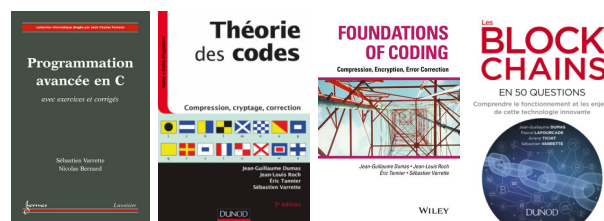
Finally, he takes part for the management committee and represents Luxembourg within multiple EU HPC projects, such as [PRACE](#) (acting Advisor), [CASTIEL](#), [ETP4HPC](#) or several COST actions. He has also concrete contributions in several strategic projects linked to HPC developed with multiple 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]:

Security and Evaluation of Distributed Computing Platforms



Education

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| 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 (Telecoms ENSIMAG , Grenoble) Speciality: Applied Mathematics, Computer Sciences & Telecommunications | with honours (<i>B/2.1</i>) rank: top 10% |

Awards

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

Teaching Experience

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| 2021 | TRUSTED COMPUTING PARADIGMS AND DISTRIBUTED LEDGER TECHNOLOGIES MTECH (UL) |
| 2019 | DATA SCIENCES TRAINING FOR EUROPEAN COMMISSION EMPLOYEES (Digital Pole) |
| 2014 – now | UNILU HIGH PERFORMANCE COMPUTING (ULHPC) SCHOOLS https://ulhpc-tutorials.rtfid.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

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| 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 |
| <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

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| 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

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| | 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) |
| | 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 <i>general</i> , <i>program</i> or <i>track</i> chair |
| | Uni.lu High Performance Computing (HPC) Manager and Team leader since 2007. |
| | Cumulated Facility Capacity: $R_{peak} = 2794.23$ 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 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 | 45 |
| Miscellaneous / Poster | 1 |
| Total: | 143 |

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|-----------------------------------|----------------------|--------------------------------|---------------------|-------------------------------|
| Publish or Perish | Papers:186 | Citations:984, Years:18 | h-index:13 | g-index:28 |
| Orbi^{1u} | Cites/year: 54.67 | Cites/paper: 5.29 | Authors/paper: 3.79 | Query date: 2021-07-27 |
| | 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, 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.