

Serge Guelton

R&D engineer in compilers

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PhD

title *Building Source-to-Source Compilers for Heterogeneous Targets*
supervisors François Irigoien (Mines ParisTech/CRI) and Ronan Keryell (Télécom Bretagne/Silkan)
description Given the fast evolution of hardware, compilers can hardly keep up. This PhD proposes a solution based on a scriptable compiler infrastructure combined with high-level code transformations.

Education

2002–2006 **French** Grande École d'Ingénieur, \simeq **Master Degree**, *Télécom Bretagne*.
specialized in software engineering & networks

Experience

Vocational

since nov. **R&D Engineer**, *QuarksLab*, Telecommuting.
2013 R&D in compilation for security: building an LLVM-based obfuscator. *LLVM, C++, Obfuscation*
2012–2013 **Chief HPC Engineer**, *Quiet-Oceans*, Plouzané.
R&D in parallel computing: building an ocean noise simulator. *C++, Python, OpenMP, MPI*
2011–2012 **R&D Engineer**, *HPC Project*, Telecommuting.
Extension and stabilization of the Par4All auto-parallelizing compiler. *C, OpenMP, CUDA, OpenCL*
2008 **R&D Engineer**, *INRIA/PARIS*, Rennes.
Automatic certification of distributed computations within the KAAPI middleware. *C++, Java, JNI*
2006–2007 **R&D Engineer**, *INRIA/MOAIIS*, Grenoble.
Extensions and applications of the KAAPI middleware for distributed and parallel computing. *C++*

Open Source Activity

2012–∞ **Pythran**, <http://pythran.readthedocs.io/>.
Compiler of a DSL embedded in Python for scientific computing
2017–∞ **LLVM Committer**, <https://llvm.org/>.
Various bug fixes and code enhancements.
2017–∞ **Frozen**, <https://github.com/serge-sans-paille/frozen>.
C++14 library providing optimized frozen version for some standard STL containers and algorithms.
2017–∞ **Easy::jit**, <https://github.com/jmmartinez/easy-just-in-time>, w/ Juan M. Martinez.
Compiler-assisted library providing JIT compilation for C++.

Computer skills

Compilation	Obfuscation, Vectorization, Parallelism	Parallelism	Distributed/Shared memory, SIMD
Scientific Computing	Legacy codes optimization and parallelization	Daily used Tools/Lang	C, C++, Python, git, GNU tools, TDD, valgrind

Languages

French	native	English	Cambridge Advanced Certificate
German	Goethe Institut Zertifikat Deutsch	Russian	rusty

Publications

Articles, talks and blog entries on compilation, scientific computing or obfuscation. Full list on <http://serge.liyun.free.fr/serge/publications.html>

Papers

Vincent Danjean, Roland Gillard, Serge Guelton, Jean-Louis Roch, and Thomas Roche. Adaptive loops with KAAPI on multicore and grid: applications in symmetric cryptography. In *Parallel Symbolic Computation*, PASCO, pages 33–42, 2007.

Mehdi Amini, Corinne Ancourt, Fabien Coelho, Béatrice Creusillet, Serge Guelton, François Irigoin, Pierre Jouvelot, Ronan Keryell, and Pierre Villalon. PIPS Is not (only) Polyhedral Software. In *First International Workshop on Polyhedral Compilation Techniques*, IMPACT, Chamonix, France, April 2011.

Serge Guelton, Mehdi Amini, and Béatrice Creusillet. Beyond do loops: data transfer generation with convex array regions. In *The 25th International Workshop on Languages and Compilers for Parallel Computing*, LCPC, Waseda University, Tokyo, Japan, September 2012.

Serge Guelton, Pierrick Brunet, Alan Raynaud, Adrien Merlini, and Mehdi Amini. Pythran: Enabling static optimization of scientific Python programs. In *Proceedings of the Python for Scientific Computing Conference (SciPy)*, June 2013.

Serge Guelton, Pierrick Brunet, Mehdi Amini, Adrien Merlini, Xavier Corbillon, and Alan Raynaud. Pythran: enabling static optimization of scientific Python programs. *Computational Science and Discovery*, 8, March 2015.

Carlos Aguilar Melchor, Joris Barrier, Serge Guelton, Adrien Guinet, Marc-Olivier Killijian, and Tancrede Lepoint. NFLlib: NTT-based fast lattice library. In *The Cryptographers' Track at the RSA Conference*, CTRSA, pages 341–356, February 2016.

Technical Talks

Serge Guelton and Adrien Guinet. Building, testing and debugging a simple out-of-tree LLVM pass. <http://serge-sans-paille.github.io/talks/llvm-developer-meeting-2015/tutorial.pdf>, October 2015. LLVM Developer Meeting.

Serge Guelton. C++ costless abstractions: the compiler view. <http://serge-sans-paille.github.io/talks/costless-abstraction-cxxcon-2016.html>, September 2016. CppCon.

Serge Guelton, Pierrick Brunet, Adrien Guinet, and Juan Manuel Martinez. Challenges when building an llvm bitcode obfuscator. <https://llvm.org/devmtg/2017-10/#talk19>, October 2017. LLVM Developer Meeting.

Serge Guelton. Surviving in an open source niche: the pythran case. <https://fosdem.org/2018/schedule/event/pythran/>, February 2018. FOSDEM.