

# Serge Guelton

R&D engineer

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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

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

## Languages

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

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## 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.