

Computer Engineer

Antoine Morvan

2 BD Sebastopol, 35000 Rennes, France

Phone: +33 671 150 960 - E-mail: antoine.morvan.pro@gmail.com

Driving licence (French “permis B”)

Personal webpage: <https://sites.google.com/site/antoinemorvanpro/>



Summary

My name is Antoine Morvan; I am interested in engineering positions in computer science. As an expert compiler engineer my last tasks involved design and implementation of tools for automated software modernization. During my PhD in the CAIRN team, I was in charge of maintaining and developing new features in GeCoS, a source-to-source C compiler targeting High-Level Synthesis and embedded systems.

Skills and Specialization

- Main developer and maintainer for a large compiler project (500k+ loc)
- Design and implementation of a compiler infrastructure utilizing **Model Driven Engineering** techniques
- **Optimizing Transformations (parallelization)** using loop transformations (**Polyhedral Model**)
- **Automatic Software Modernization** of legacy applications
- Rigorous testing through **Continuous Integrations** with non-regression test suites and regular builds
- Knowledge of **Computer Architecture** and **Operating Systems**
- Source-to-source optimizations targeting **High-Level Synthesis**
- High proficiency in (complete list below): Java, C, Eclipse, Shell Scripts, Linux, Latex, Git, SVN

Work Experience

- Jan. 2016 – Dec. 2016, **Expert engineer** in the Echoes-Labs (ex TOCEA) company in Rennes, France
 - Design and Implementation of Tools for Automated Software Modernization
 - Migration from proprietary Java framework to Spring MVC
 - Software code audit of web applications (AngularJS, Spring, Hibernate)
- June 2013 – Nov. 2014, **Research engineer** in the CAIRN Team, at University of Rennes 1, France
 - Technical integration for the ALMA European project
 - Compiling Scilab for heterogeneous multicore reconfigurable architectures
 - Maintainer of the team compiler, GeCoS (Generic Compiler Suite)
 - Developing, testing, documenting, and integrating 500k+ lines of Eclipse/Java/C
- Oct. 2009 – Dec. 2013, **Research engineer (PhD)** in the CAIRN Team, at INRIA, France
 - Nano 2012 project S2S4HLS with STMicroelectronics
 - Source-to-source for High-Level Synthesis toolbox within Eclipse
 - Exhibit efficient code structures and memory layouts in compute kernels
 - Improve applicability of nested loop pipelining (see publication)
 - Implementation of `ompVerify` (see publication) with Colorado State University
 - Teaching: Introduction to Object Oriented Programming using Java for first year students (2010)

- Feb. – Aug. 2009, **Research engineer (internship)** in the CAIRN Team, at University of Rennes 1, France
 - Design and implementation of a FSM generator for scanning loops represented as polyhedra

Education

- Ph.D. in Computer Science, at École Normale Supérieure de Cachan - antenne de Bretagne, 2009-2013
 - Topic: *Synthesis of pipelined architectures using the polyhedral model*
 - Advisors: Patrice Quinton and Steven Derrien
- Master's Degree in Computer Science at the University of Rennes 1, France, 2007-2009
 - Head of the TaskMapper student project: Graphical interface for manual hardware/software partitioning, coupled with a linker and a compiler for automatic generation of the tasks and communication on hardware resources (processors, hardware accelerators).
- Bachelor's Degree in Computer Science at the University of Rennes 1, France, 2006-2007
- DUT (Technical university degree) in Computer Science at the IUT of Lannion, France, 2004-2006
 - CowMet project (2005-2006): Linux live distribution developed on top of Slackware.

Publications

- **Journal**
 - Antoine Morvan, Steven Derrien, Patrice Quinton. *Polyhedral Bubble Insertion: A Method to Improve Nested Loop Pipelining for High-Level Synthesis*, IEEE Transactions on Computer-Aided Design, March 2013
- **International Conferences**
 - Tomofumi Yuki, Antoine Morvan, Steven Derrien. *Derivation of efficient FSM from loop nests*, The 2013 International Conference on Field-Programmable Technology (FPT'13), December 2013
 - Mythri Alle, Antoine Morvan, Steven Derrien. *Runtime Dependency Analysis for Loop Pipelining in High-Level Synthesis*, ACM / EDAC / IEEE 50th Design Automation Conference (DAC2013), June 2013
 - Antoine Morvan, Steven Derrien, Patrice Quinton. *Efficient Nested Loop Pipelining in High Level Synthesis using Polyhedral Bubble Insertion*, The 2011 International Conference on Field-Programmable Technology (FPT'11), December 2011
- **National Conferences, Workshops, Posters (selected)**
 - Antoine Floc'h, Tomofumi Yuki, Ali El-Moussawi, Antoine Morvan, Kevin Martin, Maxime Naullet, Mythri Alle, Ludovic L'Hours, Nicolas Simon, Steven Derrien, Francois Charot, Christophe Wolinski and Olivier Sentieys. *GeCoS: A Framework for Prototyping Custom Hardware Design Flows*, 13th IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM'13), September 2013
 - Vamshi Basupalli, Tomofumi Yuki, Sanjay Rajopadhye, Antoine Morvan, Steven Derrien, Patrice Quinton, David Wonnacott. *ompVerify: Polyhedral analysis for the OpenMP Programmer*, 7th International Workshop on OpenMP (IWOMP'11), June 2011
 - Antoine Morvan, Amit Kumar, Antoine Floc'h, Steven Derrien. *GeCoS: a source to source optimizing compiler for the automatic synthesis of parallel hardware accelerators*, Designing for Embedded Parallel Computing Platforms at DATE, March 2011
- **Dissertation**
 - Antoine Morvan. *Utilisation du modèle polyédrique pour la synthèse d'architectures pipelinées (Synthesis of pipelined architectures using the polyhedral model)*, Thèse de doctorat, École Normale Supérieure de Cachan - antenne de Bretagne, June 2013

Skill List

Modeling	EMF/Ecore, UML, Merise
IDE & tools	Eclipse, Git , SVN, Make, Gradle, Maven, Jenkins, Sonarqube, Redmine, Nexus, vi, Quartus, Catapult-C
Programming paradigms	Imperative, procedural, object oriented, functional, structural, logic, constraint, parallel (memory shared, transactional), query
Programming languages	Java, C, C++, scripts bash & shell, Latex, PHP/HTML/SQL, Tom/Gom, Xtend, Xtext, cup/flex
Frameworks	Struts, Spring, AngularJS
Servers	LAMP, SSH, DNS, DHCP, IPTABLE, Squid
OS	UNIX / Linux, Windows

Languages

- French: Native
- English: Full professional proficiency
- German: Notions

References

- Mr. Sylvain Leroy, former CTO of Echoes-Labs: sleroy0@gmail.com / +33 6 88 27 36 87
- Pr. Steven Derrien, former supervisor and Ph.D. advisor: steven.derrien@irisa.fr / +33 2 99 84 74 60
- Pr. Patrice Quinton, Ph.D. director: patrice.quinton@bretagne.ens-cachan.fr
- Pr. Olivier Sentieys, head of the CAIRN team: olivier.sentieys@irisa.fr / +33 2 96 46 90 41
- Pr. Sanjay Rajopadhye, Colorado State University: svr@cs.colostate.edu / (970) 491-7323
- Dr. Timo Stripf, technical coordinator of the ALMA project: timo.stripf@kit.edu / +49 721 608-46884
- Dr. Erven Rohou, member of my Ph.D. committee: erven.rohou@inria.fr / +33 2 99 84 74 93