

Curriculum Vitae

Personal information

Surname(s) / First name(s)

(Danthony)-Gonnord, Laure

Address(es)

Laboratoire d'Informatique du Parallélisme
UMR CNRS - ENS Lyon - UCB Lyon 1 - INRIA 5668
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Nationality(-ies)

French

Date of birth

Feb, 10th 1981

Assistant Professor Lyon University

Teaching

- Introduction to computer science.
- Algorithmic and Programming.
- Advanced Programming tools.
- Data Structures
- Automata, complexity, models of computation.
- Semantics, compilation.
- Mathematical computer science : cryptography, linear programming, optimisation.
- Networks.
- Computer Architecture.

Research Topics

- Embedded Systems.
- Software Verification
- Formal methods : model-checking, abstract interpretation, rewriting, smt-solving.
- Synchronous programming.
- Components and formal methods for the development of embedded systems.
- Modelisation of Quality of Service properties.
- Compilation, source to source translations.

PHD Thesis

Titre

Abstract Acceleration to improve precision in Linear Relation Analysis

University

Joseph Fourier, October,27th 2007

Jury

- President: M. Yves Ledru (UJF)
- Reports: M. François Irigoien (Mines Paris) and M. Philippe Schnoebelen (CNRS, LSV)
- Examinators: M. Bertrand Jeannet (INRIA) and M. Thomas Reps (University of Wisconsin)
- PHD advisor: M. Nicolas Halbwachs (CNRS/Verimag)

CV

2013-...

Assistant Professor

University Lyon I
Lab LIP, COMPSYS.

2009-2013

Assistant Professor

University Lille I
Lab LIFL, emeraude Group, and external member of COMPSYS (Inria/Lyon)

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|---------------------|---|
| 2008 - 2009 | Teaching and research assistant University Lyon I Lab LIP, Team INRIA Compsys |
| 2007 - 2008 | Postdoctoral position , INSA Lyon Lab CITI, ANR Project REVE. |
| 2003 - 2007 | Phd In Computer Science Grenoble University Synchronous Team, Verimag Lab advisor N. Halbwachs and teaching position , in Grenoble University |
| 2002 - 2004 | Student (“normalien”) of ENS Cachan, Computer Science |
| 2002 - 2003 | DEA d’Algorithmique (Master 2) in Paris |
| | |
| Software | |
| Aspic | A static analysis tool that implements accelerated Linear relation Analysis, (20 000 OCaml LoCs) · http://laure.gonnord.org/pro/aspic/aspic.html |
| ReveViewer | A prototype «proof of concept» for the REVE ANR Project, a remote image viewer and the software architecture around it to deal with ressources constraints (5000 C++ LoCs). |
| Sync2Smt | A static analyzer for signal programs (5000 OCaml LoCs) |
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| Publications | |
| Journal Papers | |
| | <ul style="list-style-type: none"> – On polyhedra : [HMG06]. – On ressource adaptation during execution: [GB09b]. – Static analysis for Signal. Accepted in CSI Journal, under press: [FGG12] – Survey on abstract acceleration, submitted in 2013, accepted in Science of Computer Programming, under press: [GS13a]. |
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| Conference Articles | |
| | <ul style="list-style-type: none"> – An improvement of the fixpoint iteration using SMT-solving : [MG11]. – A static analysis of synchronous programs : [GG11]. – On semantic preservation during compilation : [RGC11]. – On termination of C programs and estimation of computational complexity: [ADFG10a]. An experimental paper about real-world loops:[RAPG14]. – Static Analysis to detect memory overflows : [SMO⁺14] – [FG10]: tool Paper Aspic. – On ressource adaptation during execution: [GB09a](case study) and [GB08a](property expression). – [GH06]: abstract acceleration for verification of numerical counter automata. – [GHR04]: a translation from a temporal logic into Lustre (synchronous language) |
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| Research reports | |
| | <ul style="list-style-type: none"> – Static analyses for the compilation of synchronous programs : [FGG13] – On domain specific languages and the proble of preserving the semantic after compilation: [RGC10] – On abstract acceleration for Linear Relation Analysis: [GH10, GS13b] – On termination of flowcharts programs: [ADFG10b] and [ADF⁺09]. – On ressource adaptation during execution: [GB08b] and [GB08c] |
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| Others | |
| Jurys | <ul style="list-style-type: none"> – Member of the Phd Jury of Chan NGo, university of Rennes, July 2014. – Member of the doctoral commity of Inria Rhône Alpes since June 2014 – Member of the Phd Jury of C. Guy, dec. 2013. – Member of the Phd Jury of P. Schrammel, oct. 2012. – Member of the selection jury for an assistant prof position in Rennes (2013). |

Conferences

- PC member of WST 2014.
- PC member of TAPAS 2012 : tapas2012.inrialpes.fr.
- Reviewer of the conferences CAV, VMCAI, STACS, LCTES...
- Participation to CAV 2000 organisation

Projects

- Participation to the projects System@tic APRON and ANR REVE.
- Coordination of the Lille university BQR Project 'ALIL' (langages and analysis for software engineering) in 2011/2012.
- Coordination of the CNRS INS2I Project 'HLS-RT' for 2012 and 2013. High level synthesis under real-time constraints.

Interns

- Master student internship: Gabriel Radanne (from Ens Rennes), Jan/Aug : implementation of a termination algorithm on the llvm representation.
- Undergraduate Student: Amir Wonjiga (Ens Lyon) static analyses of X10 programs.
- Raphael Ernani Fernandes (from Brasil, May/July 2013), Master student internship : proving non termination within LLVM.
- Lucas Seguinot, (May/July 2013), undergraduate internship : analysis and implementation of a new algorithm for proving termination.
- Christophe Bacara, (May/July 2013), undergraduate internship : static analyses for pointers in LLVM
- Responsible for final engineer internships, "IMA" department of Polytech'Lille.
- Guillaume Andrieu, internship (May/August 2011) : proving termination of big C programs.
- End of study programming projects for Polytech'Lille students.
- Helping trainees while their "end of study" internship, Polytech Lille and Grenoble.

Websites

- Design of an intranet for the teaching department "IMA" of Polytech'Lille.
- Design of the emeraude website. Design of the COMPSYS website.
- Design of the "french compilation group" website.

References

- [ADF⁺09] Christophe Alias, Alain Darte, Paul Feautrier, Laure Gonnord, and Clément Quinson. Program termination and worst time complexity with multi-dimensional affine ranking functions. Research Report 7037, INRIA, 09 2009.
- [ADFG10a] C. Alias, A. Darte, P. Feautrier, and L. Gonnord. Multi-dimensional Rankings, Program Termination, and Complexity Bounds of Flowchart Programs. In *17th International Static Analysis Symposium, SAS'10*, Perpignan, France, September 2010.
- [ADFG10b] Christophe Alias, Alain Darte, Paul Feautrier, and Laure Gonnord. Bounding the computational complexity of flowchart programs with multi-dimensional rankings. Research Report 7235, INRIA, 03 2010.
- [FG10] P. Feautrier and L. Gonnord. Accelerated Invariant Generation for C Programs with Aspic and C2fsm. In *Workshop on Tools for Automatic Program Analysis, TAPAS'10*, Perpignan, France, September 2010.
- [FGG12] Paul Feautrier, Abdoulaye Gamatié, and Laure Gonnord. Enhancing the Compilation of Synchronous Dataflow Programs with a Combined Numerical-Boolean Abstraction. *CSI Journal of Computing*, 1(4):8:86–8:99, 2012. RR version = <http://hal.inria.fr/hal-00780521/en>.
- [FGG13] Paul Feautrier, Abdoulaye Gamatié, and Laure Gonnord. Enhancing the Compilation of Synchronous Dataflow Programs with a Combined Numerical-Boolean Abstraction. Research Report HAL number 780521, University of Lille and Éns Lyon, January 2013. Submitted to a journal in Jan 2013.
- [GB08a] L. Gonnord and J.-P. Babau. Runtime resource assurance and adaptation with Qinna framework : a case study. In *Proceedings of the 2008 Multiconference on Computer Science and Information Technology, Real Time Software, RTS'08*, pages 617–624, Wisla, Poland, October 2008. IEEE CS Press, CA.
- [GB08b] Laure Gonnord and Jean-Philippe Babau. Resource management with Qinna framework : the remote viewer case study. Technical Report 6562, INRIA, 06 2008.
- [GB08c] Laure Gonnord and Jean-Philippe Babau. Resource Properties Expression and Runtime assurance for embedded programs, using Qinna, a component-based software architecture. Research Report 6565, INRIA, 06 2008.
- [GB09a] L. Gonnord and J.-P. Babau. Quantity of Resource Properties Expression and Runtime Assurance for Embedded Systems. In *ACS/IEEE International Conference on Computer Systems and Applications, AICCSA'09*, pages 428–435, Rabbat, Morocco, May 2009.
- [GB09b] Laure Gonnord and Jean-Philippe Babau. Qinna : a component-based framework for runtime safe resource adaptation of embedded systems. *Scalable Computing : Practise and Experience (SCPE)*, 10(3):253–264, 2009.
- [GG11] A. Gamatié and L. Gonnord. Static analysis of synchronous programs in signal for efficient design of multi-clocked embedded systems. In *Conference on Languages, Compilers, Tools and Theory for Embedded Systems (LCTES 2011)*, Chicago, USA, April 2011.
- [GH06] L. Gonnord and N. Halbwachs. Combining widening and acceleration in linear relation analysis. In *13th International Static Analysis Symposium, SAS'06*, Seoul, Korea, August 2006.
- [GH10] Laure Gonnord and Nicolas Halbwachs. Abstract acceleration to improve precision of linear relation analysis. Research report, Verimag, 03 2010.
- [GHR04] L. Gonnord, N. Halbwachs, and P. Raymond. From discrete duration calculus to symbolic automata. In *3rd International Workshop on Synchronous Languages, Applications, and Programs, SLAP'04*, Barcelona, Spain, March 2004.
- [GS13a] Laure Gonnord and Peter Schrammel. Abstract Acceleration in Linear Relation Analysis.

Science of Computer Programming, page Under Press, 2013.
Author version : <http://hal.inria.fr/hal-00787212/en>.

- [GS13b] Laure Gonnord and Peter Schrammel.
Abstract acceleration in linear relation analysis (extended version).
Research report HAL number 787212, University of Lille and University of Oxford, February 2013.
Submitted to SCP in Feb. 2013.
- [HMG06] N. Halbwachs, D. Merchat, and L. Gonnord.
Some ways to reduce the space dimension in polyhedra computations.
Formal Methods in System Design, 29(1):79–95, 2006.
- [MG11] D. Monniaux and L. Gonnord.
Using bounded model checking to focus fixpoint iterations.
In *18th International Static Analysis Symposium, SAS'11*, Venice, Italy, September 2011.
- [RAPG14] Raphael Ernani Rodrigues, Péricles Alves, Fernando Pereira, and Laure Gonnord.
Real-world loops are easy to predict : a case study.
In *Workshop on Software Termination*, Vienne, Austria, July 2014.
- [RGC10] Vlad Rusu, Laure Gonnord, and Benoît Combemale.
Formally tracing executions from an analysis tool back to a domain specific modeling language's operational semantics.
Research Report 7423, INRIA, October 2010.
- [RGC11] V. Rusu, L. Gonnord, and B. Combemale.
Formally tracing executions back to a dsml's operational semantics.
In *Seventh European Conference on Modelling Foundations and Applications (ECMFA 2011)*, Birmingham, UK, June 2011.
- [SMO⁺14] Henrique Nazaré Willer Santos, Izabella Maffra, Leonardo Oliveira, Fernando Pereira, and Laure Gonnord.
Validation of Memory Accesses Through Symbolic Analyses.
In *OOPSLA*, Portland, Oregon, United States, October 2014.
Currently in revision process. Not formally accepted.