

ALLEGATO B

UNIVERSITÀ DEGLI STUDI DI MILANO

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Arnaud SANGNIER CURRICULUM VITAE

INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)

COGNOME	SANGNIER
NOME	ARNAUD
DATA DI NASCITA	3 GIUGNO 1981

Arnaud Sangnier
Maître de conférences (Lecturer) in Computer Science

IRIF
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Université de Paris
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75 205 Paris Cedex 13, France
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Homepage : <http://www.irif.fr/~sangnier>

French Citizenship
Birth date : June 3, 1981

Professional activities _____

- Sept. **2010**– Maître de conférences (Lecturer)
University Paris Diderot & IRIF
- 2010** Post-doctoral Fellow
Dipartimento di Informatica -Università degli studi di Genova (Italy)
Working with Giorgio Delzanno
- 2009** Post-doctoral Fellow (financed by a scholarship from the french DGA)
Dipartimento di Informatica -Università degli studi di Torino (Italy)
Working in the team of Prof. Susanna Donatelli with Jeremy Sproston

Education _____

- 2005–2008** PhD Student under the supervision of Alain Finkel and Etienne Lozes
LSV (ENS Cachan) and EDF R&D
“Verification of programs with pointers and counters”
PhD defended the 21st November 2008
- 2004–2005** Master 2 in Computer Science
Univeristé Pierre et Marie Curie - Paris
Specialty Distributed Systems
- 2004** ENSEEIHT Engineer's Degree in Computer Science and Applied Mathematics

Research interests _____

My research work falls into the general framework of the conception of formal methods for the analysis and verification of complex systems. I am especially interested in systems manipulating data whose values belong to a possible infinite domain and in models for distributed algorithms.

Supervision

- 2019-2022** Co-Supervision of PhD of Olivier Stietel
Formal tools for the design of distributed algorithms
Supervisor : B. Bollig (LSV, ENS Paris Saclay)
- 2012-2015** Co-Supervision of PhD of Paulin Fournier
Parameterized Verification of probabilistic systems
Supervisors : N. Bertrand (IRISA, Univ. Rennes) and T. Jéron (IRISA, Univ. Rennes)
- 2011-2014** Co-Supervision of PhD of Amit Kumar Dhar
Algorithms for Model-checking Flat Counter Systems
Supervisor : S. Demri (LSV, ENS Paris Saclay)
- 2018** Master 2 thesis of Fedor Ryabinin
Formal Methods for the Development of Distributed Algorithms
- 2011** Master 2 thesis of Amit Kumar Dhar
Counter Systems with Presburger-definable Reachability Sets : Decidability and Complexity

Teaching

- 2010 until now** Lecturer at University Paris Diderot (teaching duty : 192 hours/year)
Introduction to Programming (Java and Python) (lecture and laboratory) [Licence 1]
Introduction to compilation (exercises) [Licence 1]
Oriented Object Programming in Java (laboratory) [Licence 3]
Network Programming in C and Java (lecture and laboratory) [Licence 3]
System and C (laboratory) [Licence 3]
Developing environment (lecture) [Licence 3]
Logic (exercises) [Licence 3]
Advanced algorithmic (exercises) [First year of École Normale Supérieure Paris Saclay]
Concurrency (theory and practise) (lecture and laboratory) [Master 1]
Advanced automata (exercises) [Master 1]
Modelisation and specification (lecture and exercises) [Master 2]
Probabilistic Formal methods (lecture) [Master 2]
Details : <https://www.irif.fr/~sangnier/enseignement.html>
- July 2010** Lecture for PhD students at University of Genova
Model-checking and Games
- 2007–2008** Substitution at University Paris Dauphine
Network (Travaux Dirigés) [License 3]
- 2006–2007** Substitution at ENS Cachan
Java programming project [License 3]
C Programming project [Master 1]

Institutional role

- Member of the council of the department of computer science since 2011
- Responsible of the organization of 'Fête de la Science' for the department since 2016

- Public event open to pupils to discover computer science
- Responsible of the tutor students since 2012
 - Tutor students are master students helping the undergraduate students
- Responsible of the teaching duties for PhD students since 2016
- Responsible of the organization of the lecture Introduction to Programming since 2016
 - Lecture involving 500 students and 30 intervenants

Projects

- **Head of** Project ANR FREDDA on the development of formal methods for the design of distributed algorithms
 - *Participants* : LaBRI (University of Bordeaux), LSV (ENS Paris Saclay), IRIF (University Paris Diderot)
 - *Length* : from november 2017 to november 2022
 - *Budget* : 315 ke
 - *Website* : <https://www.irif.fr/~fredda/>
- Participant in Project ANR PACS on the parameterized verification of complex systems
 - *Participants* : LIPN (University of Paris 13), LS2N (University of Nantes), IRIF (University Paris Diderot)
 - *Length* : from october 2014 to october 2019
 - *Budget* : 450 ke
 - *Website* : <https://lipn.univ-paris13.fr/PACS/>
- Participant in Project ANR VERIDYC on the automated verification of C programs used for the control of critical systems
 - *Participants* : EDF (Electricité de France), LIAFA (University Paris Diderot), CEA (Centre pour l'énergie atomique), LSV (ENS Paris Saclay), VERIMAG (University Of Grenoble)
 - *Length* : from 2009 to 2012
 - *Website* : <https://sites.google.com/site/veridyc/home>
- Participant Project ANR AVERISS on the automated verification of software, 2007–2010
- Participant in Project RNTL AVERILES on the verification of programs manipulating dynamically the memory heap, 2005–2008

Implication in research

- Member of Program Committee of the international conferences Petri Nets'20, Vecos'19, Petri Nets'19, FSTTCS'14 and RP'11 and of the international workshops INFINITY'10 and QAPL'14
- Reviewer for many international conferences (CONCUR, CAV, LICS, FOSSACS, ICALP, etc)
- Participation at the organization of Gt-Verif'16, two days workshop on verification
- Participation at the organization of the international conference FORMATS'06
- Participation at the organization of the international workshops 10 Years of Verification in Cachan and M4M5

Publications

International Journals

1. Benedikt Bollig, Karin Quaas and Arnaud Sangnier. *The Complexity of Flat Freeze LTL. Logical Methods in Computer Science*, 2019. To appear.
2. Arnaud Sangnier, Nathalie Sznajder, Maria Potop-Butucaru and Sébastien Tixeuil. *Parameterized verification of algorithms for oblivious robots on a ring. Formal Methods in System Design*. Springer, 2019. To appear.
3. Stéphane Demri, Amit Kumar Dhar and Arnaud Sangnier. *Taming past LTL and flat counter systems*. *Theoretical Computer Science* 735, pages 2-23, 2018.

4. Giorgio Delzanno, Arnaud Sangnier and Riccardo Traverso. *Adding Data Registers to Parameterized Networks with Broadcast*. *Fundamenta Informaticae* 143(3-4), pages 287-316. 2016.
5. Parosh Aziz Abdulla, Giorgio Delzanno, Othmane Rezine, Arnaud Sangnier and Riccardo Traverso. *Parameterized verification of time-sensitive models of ad hoc network protocols*. *Theoretical Computer Science* 612 (1-22). Elsevier Science Publishers, 2016.
6. Stéphane Demri, Amit Kumar Dhar and Arnaud Sangnier. *Taming past LTL and flat counter systems*. *Information & Computation* 242, pages 306-339, 2015.
7. Stéphane Demri, Ranko Lazić and Arnaud Sangnier. *Model checking memoryful linear-time logics over one-counter automata*. *Theoretical Computer Science* 411 (22-24), pages 2298-2316. Elsevier Science Publishers, 2010.

International Conferences

8. Florian Horn and Arnaud Sangnier. *Deciding the existence of cut-off in parameterized rendezvous networks (CONCUR'20)*. LIPIcs . Leibniz-Zentrum für Informatik, 2020.
9. Carole Delporte-Gallet, Hugues Fauconnier, Yan Jurski, François Laroussinie and Arnaud Sangnier. *Towards synthesis of distributed algorithms with SMT solvers (NETYS'19)*. LNCS 11704, pages 200-216. Springer, 2019.
10. Arnaud Sangnier, Nathalie Sznajder, Maria Potop-Butucaru and Sébastien Tixeuil. *Parameterized verification of algorithms for oblivious robots on a ring*. In *Proceeding of 2017 Formal Methods in Computer Aided Design (FMCAD'17)*. IEEE, 2017.
11. Benedikt Bollig, Karin Quaas and Arnaud Sangnier. *The Complexity of Flat Freeze LTL*. In *Proceedings of the 28th International Conference on Concurrency Theory (CONCUR'17)*, LIPIcs 85, pages 33 :1-33 :16. Leibniz-Zentrum für Informatik, 2017.
12. Normann Decker, Peter Habermehl, Martin Leucker, Arnaud Sangnier and Daniel Thomas. *Model-checking Counting Temporal Logics on Flat Structures*. In *Proceedings of the 28th International Conference on Concurrency Theory (CONCUR'17)*, LIPIcs 85, pages 29 :1-29 :17. Leibniz-Zentrum für Informatik, 2017.
13. Radu Iosif and Arnaud Sangnier. *How Hard is It to Verify Flat Affine Counter Systems with the Finite Monoid Property ?*. in *Proceedings of the 14th International Symposium on Automated Technology for Verification and Analysis (ATVA'16)*, LNCS 9938, pages 89-105. Springer, 2016.
14. Patricia Bouyer, Nicolas Markey, Mickael Randour, Arnaud Sangnier and Daniel Stan. *Reachability in Networks of Register Protocols under Stochastic Schedulers*. In *Proceedings of the 43th International Colloquium on Automata, Languages and Programming - Part II (ICALP'16 (2))*, LIPIcs 55, pages 106 :1-106 :14. Leibniz-Zentrum für Informatik, 2016.
15. Parosh Aziz Abdulla, Radu Ciobanu, Richard Mayr, Arnaud Sangnier and Jeremy Sproston. *Qualitative Analysis of VASS-Induced MDPs*. In *Proceedings of the 19th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS'16)*, LNCS 9634, pages 319-334. Springer, 2016.
16. Nathalie Bertrand, Paulin Fournier and Arnaud Sangnier. *Distributed Local Strategies in Broadcast Networks*. *Proceedings of the 26th International Conference on Concurrency Theory (CONCUR'15)*, LIPIcs 42, pages 44-57. Leibniz-Zentrum für Informatik, 2015.
17. François Laroussinie, Nicolas Markey and Arnaud Sangnier. *ATLsc with partial observation*. In *Proceedings of the 6th International Symposium on Games, Automata, Logics and Formal Verification (GandALF'15)*, EPTCS 193, pages 43-57. 2015.
18. Stéphane Demri and Amit Kumar Dhar and Arnaud Sangnier. *Equivalence Between Model-Checking Flat Counter Systems and Presburger Arithmetic*. In *Proceedings of the 8th International Workshop on Reachability Problems (RP'14)*, LNCS 8762, pages 85-97. Springer, 2014.

19. Nathalie Bertrand and Paulin Fournier and Arnaud Sangnier. *Playing with probabilities in Reconfigurable Broadcast Networks*. In *Proceedings of the 17th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS'14)*, LNCS 8412, pages 134-148. Springer, 2014.
20. Giorgio Delzanno and Arnaud Sangnier and Riccardo Traverso. *Parameterized Verification of Broadcast Networks of Register Automata*. In *Proceedings of the 7th International Workshop on Reachability Problems (RP'13)*, LNCS 8169, pages 109-121. Springer, 2013.
21. Parosh Abdulla and Richard Mayr and Arnaud Sangnier and Jeremy Sproston. *Solving Parity Games on Integer Vectors*. In *Proceedings of the 24th International Conference on Concurrency Theory (CONCUR'13)*, LNCS 8052, pages 106-120. Springer, 2013.
22. Stéphane Demri and Amit Kumar Dhar and Arnaud Sangnier. *On the Complexity of Verifying Regular Properties on Flat Counter Systems*. In *Proceedings of the 40th International Colloquium on Automata, Languages and Programming - Part II (ICALP'13 (2))*, LNCS 7966, pages 162-173. Springer, 2013.
23. Giorgio Delzanno and Arnaud Sangnier and Riccardo Traverso and Gianluigi Zavattaro. *On the Complexity of Parameterized Reachability in Reconfigurable Broadcast Networks*. In *Proceedings of the 32nd International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS'12)*, LIPIcs 18, pages 289-300. Leibniz-Zentrum für Informatik, 2012.
24. Stéphane Demri and Amit Kumar Dhar and Arnaud Sangnier. *Taming Past LTL and Flat Counter Systems*. In *Proceedings of the 6th International Joint Conference on Automated Reasoning (IJCAR'12)*, LNAI 7634, pages 179-193. Springer, 2012.
25. Giorgio Delzanno and Arnaud Sangnier and Gianluigi Zavattaro. *Verification of Ad Hoc Networks with Node and Communication Failures*. In *Proceedings of the 32nd International Conference on Formal Techniques for Distributed Systems (FMOODS/FORTE'12)*, LNCS 7273, pages 235-250. Springer, 2012.
26. Nathalie Bertrand and Barbara König and Giorgio Delzanno and Arnaud Sangnier, Jan Stückrath. *On the Decidability Status of Reachability and Coverability in Graph Transformation Systems*. In *Proceedings of the 23rd International Conference on Rewriting Techniques and Applications (RTA'12)*, LIPIcs 15, pages 101-116. Leibniz-Zentrum für Informatik, 2012.
27. Parosh Abdulla and Giorgio Delzanno and Othmane Rezine and Arnaud Sangnier and Riccardo Traverso. *On the Verification of Timed Ad Hoc Networks*. In *Proceedings of the 9th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS'11)*, LNCS 6919, pages 256-270. Springer, 2011.
28. Giorgio Delzanno and Gianluigi Zavattaro and Arnaud Sangnier. *On the Power of Cliques in the Parameterized Verification of Ad Hoc Networks*. In *Proceedings of the 14th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS'11)*, LNCS 6269, pages 313-327. Springer, 2011.
29. Sébastien Labbé and Arnaud Sangnier. *Formal verification of industrial software with dynamic memory management*. In *Proceedings of the 16th IEEE Pacific Rim International Symposium on Dependable Computing (PRDC'10)*, pages 77-84, IEEE Computer Society, 2010.
30. Giorgio Delzanno and Gianluigi Zavattaro and Arnaud Sangnier. *Parameterized Verification of Ad Hoc Networks*. In *Proceedings of the 21st International Conference on Concurrency Theory (CONCUR'10)*, LNCS 6269, pages 313-327. Springer, 2010.
31. Stéphane Demri and Arnaud Sangnier. *When Model-Checking Freeze LTL over Counter Machines Becomes Decidable*. In *Proceedings of the 13th International Conference on Foundations*

of Software Science and Computation Structures (FoSSaCS'10), LNCS 6014, pages 176-190. Springer, 2010.

32. Alain Finkel and Arnaud Sangnier. *Mixing coverability and reachability to analyze VASS with one zero-test*. In *Proceedings of the 36th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM'10)*, LNCS 5901, pages 394-406. Springer, 2010.
33. Pierre-Alain Reynier and Arnaud Sangnier. *Weak Time Petri Nets strike back !* In *Proceedings of the 20th International Conference on Concurrency Theory (CONCUR'09)*, LNCS 5710, pages 557-571. Springer, 2009.
34. Alain Finkel, Etienne Lozes and Arnaud Sangnier. *Towards model-checking programs with lists*. In *Infinity in Logic and Computation, Selected Papers of the International Conference held in Cape Town, South Africa, November 2007*, LNAI 5489, pages 56-86. Springer, 2009.
35. Alain Finkel and Arnaud Sangnier. *Reversal-bounded counter machines revisited*. In *Proceedings of the 33rd International Symposium on Mathematical Foundations of Computer Science (MFCS'08)*, LNCS 5162, pages 323-334. Springer, 2008.
36. Stéphane Demri, Ranko Lazić and Arnaud Sangnier. *Model checking freeze LTL over one-counter automata*. In *Proceedings of the 11th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS'08)*, LNCS 4962, pages 490-504. Springer, 2008.
37. Davide D'Aprile, Susanna Donatelli, Arnaud Sangnier and Jeremy Sproston. *From Time Petri Nets to Timed Automata : an Untimed Approach*. In *Proceedings of the 13th International Conference on Tools and Algorithms for Construction and Analysis of Systems (TACAS'07)*, LNCS 4424, pages 216-230. Springer, 2007.

International Workshops

38. Florent Bouchy, Alain Finkel and Arnaud Sangnier. *Reachability in Timed Counter Systems*. In *Joint Proceedings of the 8th, 9th and 10th International Workshops on Verification of Infinite State Systems (INFINITY'06, '07, '08)*, ENTCS 239, pages 167-178. Elsevier Science Publishers, 2009.
39. Sébastien Bardin, Alain Finkel, Etienne Lozes and Arnaud Sangnier. *From Pointer Systems to Counter Systems Using Shape Analysis*. In *Proceedings of the 5th International Workshop on Automated Verification of Infinite-State Systems (AVIS'06)*.

Thesis Reports

40. Arnaud Sangnier. *Verification of systems with counters and pointers*. PhD Thesis, Laboratoire Spécification et Vérification, ENS de Cachan, France, Novembre 2008.
41. Arnaud Sangnier. *Towards the verification of Time Coloured Petri Nets*. Rapport de Master, Université Paris 6, Septembre 2005.

Research Stays

Two weeks stays at the group of Parosh A. Abdulla - University of Upsalla - Sweden - 2010

One week stay at the group of Parosh A. Abdulla - University of Upsalla - Sweden - 2011

One week stay at the group of Igor Potapov - University of Liverpool - UK - 2012

One week stay at the group of Parosh A. Abdulla - University of Upsalla - Sweden - 2013

Two weeks stays to visit Karin Quaas - University of Leipzig - Germany - 2014

One week stay to visit the group of Martin Leucker - University of Lübeck - Germany - 2015

Two weeks stay at Chennai Mathematical Institute - India - 2016

Presentations

International conferences

Invited Speaker at Gandalf'16

Presentation at NETYS'19, FMCAD'17, ATVA'16, RP'14, FSTTCS'12, FOSSACS'11, CONCUR'10, FoSSaCS'10, SOFSEM'10, CONCUR'09, FoSSaCS'08, ILC'07 et TACAS'07.

International workshops

Invited Speaker at Displexity 2014 (Workshop on DIStributed Computing : Computability and COMPLEXITY)

Invited Speaker at ACTS 2015 (Workshop on Automata, Concurrency, and Timed Systems)

Invited Speaker at the Dagstuhl Seminar on Verification of Evolving Graph Structures 2015

Invited Speaker at the Bertinoro Workshop on Distributed Runtime Verification 2016

Invited Speaker at the Annual Meeting of the french research group on Verification 2016

Invited Speaker at Gregynog 71717 (International Workshop on Vector Addition Systems and related stuff) - 2017

Invited Speaker at the Dagstuhl Seminar on Formal Methods and Fault-Tolerant Distributed Computing : Forging an Alliance 2018

Invited Speaker at VDS 2019 (Workshop on Verification of Distributed Systems)

Seminars

Talks in laboratories of the following universities : Laboratory for Foundations of Computer Science of University of Edinburgh, Oxford Computing Laboratory, Department of Computer Science , Chennai Mathematical Institute, VERIMAG-Grenoble, LIF-Marseilles, LIAFA-Paris, LSV-Cachan, LABRI-Bordeaux and IRISA-Rennes

Skills

Programming

Java, C, Caml, Python

Languages

French (native speaker), English (fluent), Italian (fluent), German (good)

References

Stéphane Demri

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Data

15/09/2020

Luogo

Parigi