

Nicolas Nisse, Inria Research Officer (CR1)

Engineer Supélec, Ph.D. in Computer Sciences, HDR

Project team COATI,
Inria Sophia Antipolis
2004, route des Lucioles - B.P. 93
F-06902 Sophia Antipolis Cedex, France
Tel. : +33 (0)4 97 15 53 28
Fax : +33 (0)4 92 38 53 80

26th November 1980
french

email : nicolas.nisse@inria.fr

Webpage :

<http://www-sop.inria.fr/members/Nicolas.Nisse/>

Current Position

Inria Research Officer since Sept. 2009, Chargé de recherche 1st classe since Sept. 2011, in the team project *COATI* (former MASCOTTE), Inria, I3S (CNRS/UNS), (PES : 2011-14)

Education

2014 : Habilitation à Diriger des Recherches (HDR), Univ. Nice Sophia Antipolis

Algorithmic complexity Between Structure and Knowledge How Pursuit-evasion Games help.
defended May the 26th, 2014, Inria, Sophia Antipolis

Jury : Victor Chepoi, *Professor, Aix-Marseille Univ.*, David Coudert, *CR Inria, Sophia Antipolis*, Fedor V. Fomin, *Professor, Univ. of Bergen, Norway*, Pierre Fraigniaud, *DR CNRS, Univ. Paris Diderot*, Cyril Gavoille, *Professor, Univ. Bordeaux (referee)*, Dimitrios M. Thilikos, *DR CNRS, Univ. Montpellier 2 & Univ. d'Athènes (referee)*, Jean-Charles Régin, *Professor, Univ. Nice Sophia Antipolis (president)*, Peter Widmayer, *Professor, ETH Zürich, Switzerland (referee)*.

2004-2007 : Ph.D. thesis in Computer Sciences,

doctoral school of University Paris-Sud (Orsay), mention Très Honorable

Graph Searching and related problems. Graph minors, connected search strategies, and distributed approach. under the supervision of Pierre Fraigniaud, defended July the 2nd, 2007, LRI, Orsay, France

Jury : Jean-Paul Allouche, *DR CNRS, LRI (president)* Pierre Fraigniaud, *DR CNRS, LRI, supervisor* Dieter Kratsch, *Professor, Université de Metz, LITA (referee)* Dimitrios M. Thilikos, *Professor, Université d'Athènes* Stéphan Thomassé, *Professor, Université Montpellier 2, LIRMM (referee)*

2003-2004 : Master thesis in Informatics, DEA Informatique Distribuée, mention Très Bien,
doctoral school of University Paris-Sud, Orsay, France.

2001-2004 : Engineer Supélec Supélec, Gif-sur-Yvette, in the field of information and energy sciences.

2001-2002 : Licence of Mathematics, mention Bien Université Paris VI

1998-2001 : Classes préparatoires MPSI and MP*, lycée Thiers, Marseille.

1998 : Baccalauréat S, mention Très Bien, speciality Mathematics.

Languages

French (mother tongue). English, Spanish (fluent). German (basic notions).

Professional Experiences

2008-2009 : Postdoctoral fellow INRIA in the project *MASCOTTE*, I3S, CNRS UMR6070, Université Nice Sophia Antipolis, INRIA.

2007-2008 : Postdoctoral fellow in the project *Anillo en Redes* (CONICYT), Departamento de Ingeniería Matemática, Universidad de Chile, Santiago, Chile.

Teaching

Winter Schools

ENS Lyon : Programmation linéaire et combinatoire, with F. Havet and F. Giroire, Jan. 23-27th, 2012.

Inria Sophia : Complex Networks, Jan 27-31th, 2014.

Classe préparatoire, Lycée International de Valbonne (in partnership with INRIA), Sophia Antipolis.

since Sept. 2011 : **co-responsible** (with M. De Falco) of the Computer-Science course in MPSI
Creation of a new class in partnership with INRIA. In charge of the course.

2011-12 (40h), 2012-13 (40h), 2013-14 (14h).

Master 2 UBINET (Ubiquitous Networking and Computing) Univ. de Nice Sophia Antipolis.

since Sept. 2011 : **in charge** of the course Algorithms for Telecommunications.

2009-10 (6h), 2010-11 (12h), 2011-12 (12h), 2012-13 (9h), 2013-14 (9h).

Graph Theory (graph theory, gathering problem, compact routing)

Master 2 MDFI (Discrete Mathematics and Computer Sciences) Univ. de la Méditerranée.

2008-09 (20h), 2009-10 (10h), 2010-11 (10h), 2011-12 (20h), 2012-13 (20h)

Graph Theory (flows, matching, linear programming, graph decompositions)

Supélec (engineer school), dpt Informatics Gif-sur-Yvette. (monitorat)

2006-2007

Computer Systems Architecture, 27h

Data Structures and Algorithms (Java), 18h TP

Software Engineering and Deployment of Systems 36h TP

Programming Model 18h TP

2005-2006

Computer Systems Architecture, 27h TP

Data Structures and Algorithms (Java), 36h TP

Software Engineering and Deployment of Systems 36h TP

2004-2005

Computer Systems Architecture, 63h TP

Software Engineering and Deployment of Systems 36h TP

List of Publications

Note. You can find my publications here :

<http://www-sop.inria.fr/members/Nicolas.Nisse/publications/>

Conference Proceedings

1. R. Baldoni, N. Nisse and M. van Steen (Eds.). *International Conference on Principles of Distributed Systems* (OPODIS), Nice, France, Dec. 2013. LNCS 8314, Springer.
2. Y. Busnel, N. Nisse and F. Rousseau (Eds.). *15th Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications* (AlgoTel), Pornic, France, 2013. CNRS, LINA, Université de Nantes.

International Journals (18)

1. F. Becker, A. Kosowski, M. Matamala, N. Nisse, I. Rapaport, K. Suchan, and I. Todinca. *Allowing each node to communicate only once in a distributed system : shared whiteboard models*. Accepted in **Distributed Computing**.
2. G. D'Angelo, G. Di Stefano, A. Navarra, N. Nisse, and K. Suchan. *A unified approach for different tasks on rings in robot-based computing systems*. Accepted in **Algorithmica**.
3. F.V. Fomin, F. Giroire, A. Jean-Marie, D. Mazauric and N. Nisse, *To satisfy Impatient Web surfers is Hard*. Accepted in **Theoretical Computer Science**.
4. A. Kosowski, B. Li, N. Nisse and K. Suchan. *k-Chordal Graphs : from Cops and Robber to Compact Routing via Treewidth*. Accepted in **Algorithmica**.
5. J. Araújo, V. Campos, F. Giroire, N. Nisse, L. Sampaio, and R. Soares. *On the hull number of some graph classes*. **Theor. Comput. Sci.**, 475 :1-12, 2013.
6. L. Barrière, P. Flocchini, F. V. Fomin, P. Fraigniaud, N. Nisse, N. Santoro et D. M. Thilikos, *Connected Graph Searching*. **Information and Computation**, 219 :1-16, 2012.
7. N. Nisse, I. Rapaport and K. Suchan *Distributed computing of efficient routing schemes in generalized chordal graphs*. **Theoretical Computer Science**, 444 :17-27, 2012.
8. N. Cohen, D. Coudert, D. Mazauric, N. Nepomuceno and N. Nisse, *Tradeoffs in process strategy games with application in the WDM reconfiguration problem*. **Theoretical Computer Science**, Volume 412(35), pages 4675-4687, 2011.
9. J. Chalopin, V. Chepoi, N. Nisse, Y. Vaxès, *Cop and robber games when the robber can hide and ride*. **SIAM Journal of Discrete Maths.**, Vol. 25(1), pages 333-359, 2011.
10. F.V. Fomin, P. Golovach, J. Kratochvil, N. Nisse and K. Suchan, *Pursuing a fast robber on a graph*. **Theoretical Computer Science**, Volume 411(7-9), pages 1167-1181, 2010.
11. D. Ilcinkas, N. Nisse, D. Soguet, *The Cost of Monotonicity in Distributed Graph Searching*. **Distributed Computing**, Volume 22(2), pages 117-127, 2009.
12. O. Amini, F. Mazoit, N. Nisse, S. Thomassé, *Submodular Partition Functions*. **Discrete Maths**, Volume 309(20), pages 6000-6008, 2009.
13. N. Nisse, *Connected Graph Searching in Chordal Graphs*. **Discrete Applied Mathematics**, Volume 157 (12), pages 2603-2610, 2009.

14. N. Nisse, D. Soguet, *Graph Searching with advice*. **Theoretical Computer Science**, Volume 410 (14), pages 1307-1318, 2009.
15. F.V. Fomin, P. Fraigniaud, N. Nisse, *Nondeterministic Graph Searching : From Pathwidth to Treewidth*. **Algorithmica**, Volume 53 (3), pages 358-373, 2009.
16. P. Fraigniaud, N. Nisse, *Monotony Properties of Connected Visible Graph Searching*. **Information and Computation**, Volume 206, pages 1383-1393, 2008.
17. L. Blin, P. Fraigniaud, N. Nisse, S. Vial, *Distributed Chasing of Network Intruders by Mobile Agents*. **Theoretical Computer Science**, Volume 399 (1-2), pages 12-37, 2008.
18. F. Mazoit, N. Nisse, *Monotonicity Property of Non-Deterministic Graph Searching*. **Theoretical Computer Science**, Volume 399 (3), pages 169-178, 2008.

Proceedings of International Conferences (29)

1. D. Coudert, D. Mazauric and N. Nisse. *Experimental Evaluation of a Branch and Bound Algorithm for computing Pathwidth*. Proceedings of the 13rd Symposium on Experimental Algorithms (**SEA**), Springer LNCS 8504, pages 46-58, 2014.
2. J. Araujo, N. Nisse and S. Pérennes. *Weighted Coloring in Trees*. Proceedings of the 31st Symposium on Theoretical Aspects of Computer Science (**STACS**), Schloss Dagstuhl, pages 75-86, 2014.
3. G. D'Angelo, A. Navarra and N. Nisse. *Gathering and Exclusive Searching on Rings under Minimal Assumptions*. Proceedings of 15th International Conference on Distributed Computing and Networking (**ICDCN**), LNCS 8314, pages 149-164, Springer, 2014.
4. L. Blin, J. Burman, and N. Nisse. *Exclusive graph searching*. In Proceedings of 21st European Symposium on Algorithms (**ESA**), LNCS 8125, pages 181-192. Springer, 2013.
5. G. D'Angelo, G. Di Stefano, A. Navarra, N. Nisse, and K. Suchan. *A unified approach for different tasks on rings in robot-based computing systems*. In 15th Workshop on Advances in Parallel and Distributed Computational Models (**APDCM**). IEEE, 2013.
6. F. Giroire, D. Mazauric, N. Nisse, S. Pérennes, and R.P. Soares. *Connected surveillance game*. In Proceedings of the 20th International Colloquium on Structural Information and Communication Complexity (**SIROCCO**), LNCS 8179. Springer, 2013.
7. F. Giroire, R. Modrzejewski, N. Nisse, and S. Pérennes. *Maintaining balanced trees for structured distributed streaming systems*. In Proceedings of the 20th International Colloquium on Structural Information and Communication Complexity (**SIROCCO**), LNCS 8179. Springer, 2013.
8. N. Nisse and R.P. Soares. *On the monotonicity of process number*. In 7th Latin-American Algorithms, Graphs and Optimization Symposium (**LAGOS**). Elsevier, 2013. to appear in Electronic Note Discrete Maths.
9. L. Blin, J. Burman and N. Nisse. *Distributed Exclusive and Perpetual Tree Searching*. Brief Announcement in Proceedings of 26th International Symposium on Distributed Computing (**DISC**), Springer LNCS 7611, pages 407-408, 2012.
10. A. Kosowski, B. Li, N. Nisse and K. Suchan. *k-Chordal Graphs : from Cops and Robber to Compact Routing via Treewidth*. In Proceedings of 39th International Colloquium on Automata, Languages and Programming (**ICALP**), track C, Springer LNCS 7392, pages 610-622, 2012.

11. F. Becker, A. Kosowski, N. Nisse, I. Rapaport and K. Suchan. *Allowing each node to communicate only once in a distributed system : shared whiteboard models*. In Proceedings of 24th ACM Symposium on Parallelism in Algorithms and Architectures (**SPAA**), to appear. 2012.
12. F.V. Fomin ; F. Giroire, A. Jean-Marie, D. Mazauric, N. Nisse, *To Satisfy Impatient Web surfers is Hard*. In Proceedings of 6th International Conference on FUN with Algorithms (**FUN**), Springer LNCS 7288, pages 166-176, 2012.
13. S. Belhareth, D. Coudert, D. Mazauric, N. Nisse and I. Tahiri. *Reconfiguration avec contraintes physiques dans les réseaux WDM*. In Proceedings of Workshop on New Trends in Optical Networks Survivability (**Netsurviv**), IEEE, colocated with ICC, to appear, 2012.
14. F. Becker, M. Matamala, N. Nisse, I. Rapaport, K. Suchan, et I. Todinca. *Adding a referee to an interconnection network : What can(not) be computed in one round*. In Proceedings of 25th IEEE International Parallel & Distributed Processing Symposium (**IPDPS**), IEEE, pages 508-514, 2011.
15. N. Hanusse, D. Ilcinkas, A. Kosowski and N. Nisse, *Locating a target with an agent guided by unreliable local advice*. To appear in Proceedings of 29th ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC**), pages 355-364, 2010.
16. N. Cohen, D. Coudert, D. Mazauric, N. Nepomuceno and N. Nisse, *Tradeoffs in process strategy games with application in the WDM reconfiguration problem*. In Proceedings of 5th International Conference on FUN with Algorithms (**FUN**), Springer LNCS 6099, pages 121-132, 2010.
17. F. Huc, C. Molle-Caillouet, N. Nisse, S. Pérennes and H. Rivano, *Stability of a local greedy distributed routing algorithm*. To appear in Proceedings of the 12th Workshop on Advances in Parallel and Distributed Computational Models (**APDCM**), IEEE, 2010.
18. N. Nisse, I. Rapaport and K. Suchan, *Distributed computing of efficient routing schemes in generalized chordal graphs*. Proceedings of the “16th Colloquium on Structural Information and Communication Complexity” (**SIROCCO**), Springer, LNCS 5869, pages 252-265, 2009.
19. J.-C. Bermond, N. Nisse, P. Reyes, H. Rivano, *Fast Data Gathering in Radio Grid Networks*. Proceedings of the ”8th international conference on Ad Hoc Networks and Wireless (**AdHoc-NOW**)”, Springer, LNCS 5793, pages 69-82, 2009.
20. D. Coudert, D. Mazauric, N. Nisse, *On Rerouting Connection Requests in Networks with Shared Bandwidth*. Proceedings of the DIMAP Workshop on Algorithmic Graph Theory (**AGT**), Elsevier, Electronic Notes in Discrete Maths, Volume 32, pages 109-116, 2009.
21. D. Coudert, F. Huc, D. Mazauric, N. Nisse, J.-S. Sereni, *Routing Reconfiguration/Process Number : Coping with Two Classes of Services*. Proceedings of the “13th Conference on Optical Network Design and Modeling” (IFIP/IEEE, **ONDM**), 2009.
22. N. Nisse, K. Suchan, *Fast Robber in Planar Graphs*. Proceedings of the “34th International Workshop on Graph-Theoretic Concepts in Computer Science” (**WG**), Springer, LNCS 5344, pages 312-323, 2008.
23. D. Ilcinkas, N. Nisse, D. Soguet, *The Cost of Monotonicity in Distributed Graph Searching*. Proceedings of the “11th International Conference On Principles Of Distributed Systems” (**OPODIS**), Springer, LNCS 4878, pages 415-428, 2007.

24. F. Mazoit, N. Nisse, *Monotonicity Property of Non-Deterministic Graph Searching*. Proceedings of the “33rd International Workshop on Graph-Theoretic Concepts in Computer Science” (**WG**), Springer, LNCS 4769, pages 33-44, 2007.
25. N. Nisse, D. Soguet, *Graph Searching with advice*. Proceedings of the “14th Colloquium on Structural Information and Communication Complexity” (**SIROCCO**), Springer, LNCS 4474, pages 51-65, 2007.
26. L. Blin, P. Fraigniaud, N. Nisse, S. Vial, *Distributed Chasing of Network Intruders by Mobile Agents*. Proceedings of the “13th Colloquium on Structural Information and Communication Complexity” (**SIROCCO**), Springer, LNCS 4056, pages 70-84, 2006.
27. P. Fraigniaud, N. Nisse, *Monotony Properties of Connected Visible Graph Searching*. Proceedings of the “32nd International Workshop on Graph-Theoretic Concepts in Computer Science” (**WG**), Springer, LNCS 4271, pages 229-240, 2006.
28. P. Fraigniaud, N. Nisse, *Connected Treewidth and Connected Graph Searching*. Proceedings of the “7th Latin American Theoretical Informatics Symposium” (**LATIN**), Springer, LNCS 3887, pages 479-490, 2006.
29. F. V. Fomin, P. Fraigniaud, N. Nisse, *Nondeterministic Graph Searching : From Pathwidth to Treewidth*. Proceedings of the “30th International Symposium on Mathematical Foundations of Computer Science” (**MFCS**), Springer, LNCS 3618, pages 364-375, 2005.

Proceedings of National Conferences (15)

1. A. Kosowski, B. Li, N. Nisse and K. Suchan. *k-Chordal Graphs : from Cops and Robber to Compact Routing via Treewidth*. In 14es Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 83-86, 2012.
2. F. V. Fomin, F. Giroire, A. Jean-Marie, D. Mazauric and N. Nisse, *Satisfaire un internaute impatient est difficile*. In 14es Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 79-82, 2012. (best paper award)
3. L. Blin, J. Burman and N. Nisse, *Nettoyage perpétuel de réseaux*. In 14es Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 31-34, 2012.
4. S. Belhareth, D. Coudert, D. Mazauric, N. Nisse and I. Tahiri. *Reconfiguration avec contraintes physiques dans les réseaux WDM*. In 13es Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 17-20, 2011.
5. F. Becker, M. Matamala, N. Nisse, I. Rapaport, K. Suchan, and I. Todinca. *Reconstruire un graphe en une ronde*. In 13es Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 31-34, 2011.
6. N. Cohen, D. Coudert, D. Mazauric, N. Nepomuceno and N. Nisse, *Tradeoffs in routing reconfiguration problems*. In 12me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 119-122, 2010.
7. N. Hanusse, D. Ilcinkas, A. Kosowski and N. Nisse, *Comment battre la marche aléatoire en comptant ?*. In 12me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 27-30, 2010.

8. J.-C. Bermond, N. Nisse, P. Reyes, H. Rivano, *Fast Data Gathering in Radio Grid Networks*. Proceedings of the 11me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 53-56, 2009.
9. D. Coudert, F. Huc, D. Mazauric, N. Nisse, J.-S. Sereni, *Reconfiguration dans les réseaux optiques*. Proceedings of the 11me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), pages 25-28, 2009.
10. N. Nisse, K. Suchan, *Voleur véloce dans un réseau planaire*. Proceedings of the 10me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), INRIA, pages 29-32, 2008.
11. D. Ilcinkas, N. Nisse, D. Soguet, *Le cout de la monotonie dans les stratégies d'encerclement réparti*. Proceedings of the 10me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), INRIA, pages 33-36, 2008.
12. N. Nisse, D. Soguet, *Stratégies d'encerclement avec information*. Proceedings of the 9me Rencontres Francophones sur les aspects Algorithmiques des Télécommunications (**AlgoTel**), INRIA, pages 49-52, 2007.
13. L. Blin, P. Fraigniaud, N. Nisse, S. Vial, *Encerclement réparti d'un fugitif dans un réseau par des agents mobiles*. Proceedings of the 8mes Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (**AlgoTel**), INRIA pages 89-92, 2006.
14. F. V. Fomin, P. Fraigniaud, N. Nisse, *Stratégies d'encerclement non déterministes*. Proceedings of the 8mes Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (**AlgoTel**), INRIA pages 81-84, 2006.
15. P. Fraigniaud, N. Nisse, *Stratégies d'encerclement connexes dans un réseau*. Proceedings of the 7mes Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (**AlgoTel**), INRIA pages 13-16, 2005.

International Conferences without Proceedings

1. J. Chalopin, V. Chepoi, N. Nisse and Y. Vaxès, *Cop and robber games when the robber can hide and ride* (selection on abstract). 8th French Combinatorial Conf. (**FCC**), 2010.

Invited Talks

1. N. Nisse, *Fractional combinatorial two-player games*. 27th European Conference on Operational Research (**EURO**), Rome, Italy, 2013.
2. N. Nisse, *Routing Reconfiguration in WDM Networks*. 5th Workshop on GRaph Searching, Theory and Applications (**GRASTA**), Banff, Canada, 2012
3. N. Nisse, *Routing with faulty advice*. IMSA Workshop on Algorithms and Randomness, Santiago, Chili, 2011
4. N. Nisse, *Graph Searching and Graph Decompositions*. 24th European Conference on Operational Research (**EURO**), Lisbonne, Portugal, 2010
5. N. Nisse, *Distributed Graph Searching*. 2nd Workshop on GRaph Searching, Theory and Applications (**GRASTA**), Redonda, Brésil, 2008

6. N. Nisse, *Monotonicity Property of Non-Deterministic Graph Searching*. 1st Workshop on GRAPh Searching, Theory and Applications (**GRASTA**), Crête, 2006
-

Submitted/Technical Reports

1. J.-C. Bermond, B. Li, Min-Li Yu, N. Nisse, H. Rivano, *Minimum delay Data Gathering in Radio Networks : (small) Interferences do not really matter*. In revision for TCS.
2. O. Amini, D. Coudert, N. Nisse, *Some Results on Non-deterministic Graph Searching in Trees*. Research Report, INRIA-00174965, HAL, Sophia Antipolis, France, Sept. 2007. In revision for TCS.
3. F. Giroire, I. Lamprou, D. Mazauric, N. Nisse, S. Pérennes and R. P. Soares. *Connected Surveillance Game*. Research Report, INRIA-RR8297, Sophia Antipolis, France, 2013. Submitted.
4. F. Giroire, R. Modrzejewski, N. Nisse and S. Pérennes, *Maintaining Balanced Trees For Structured Distributed Streaming Systems*. Research Report, INRIA-RR8309, Sophia Antipolis, France, 2013. Submitted
5. J. Araujo, N. Nisse and S. Pérennes. *Weighted Coloring in Trees*. Research Report, INRIA-RR8249, Sophia Antipolis, France, 2013. Submitted
6. F. Giroire, N. Nisse, S. Pérennes and R.P. Soares. *Fractional Combinatorial Games*. Research Report, RR-8371, Inria, Sophia Antipolis, France, 2013.
7. E. Markou, N. Nisse and S. Pérennes. *Exclusive Graph Searching vs. Pathwidth*. Research Report, INRIA-RR8523, Sophia Antipolis, France, 2014.
8. G. D'Angelo, X. Défago and N. Nisse. Stigmergy of anonymous agents in discrete environments. On going work.
9. P. Berthomé, N. Nisse, *A unified FPT Algorithm for Width of Partition Functions*. Research Report, INRIA-00321766, HAL, Sophia Antipolis, France, Sept. 2008.

Description of my Research

I study **algorithms in graphs**, mainly applied to the **spreading of the information in telecommunications networks**.

I study the structure of graphs and some routing problems through Pursuit-Evasion games. In these games, a team of searchers aims at capturing a fugitive in a graph. The mobile agents follow the paths in the graph with bounded or unbounded speed and satisfying some constraints. The (NP-hard) problem is to minimize the number of searchers required to capture the fugitive. Two main variants have been studied : the **graph searching games** where mobile agents move simultaneously, and the **cops and robber games** where searchers and fugitive move by turns. These two variants are very different since they have not the same algorithmic applications, and the tools used for their study are completely different too.

My contributions have their applications mainly in routing problems in Wavelength-Division Multiplexing (WDM) networks, large scale networks (e.g., the Internet) and wireless networks. All these networks are facing difficult problems, e.g., either NP-complete problems or problems that become difficult to be handled because of networks size. To deal with this, my approach consists into **taking advantage of specific structural properties of real instances for the design of efficient algorithms**.

My objectives are twofold. On the one hand, I want to understand which structural properties can help to solve problems relative to the spreading of the information in networks, and for this purpose, I am interested in determining which properties are shared by real networks. On the other hand, I want to develop (*via* the graph searching paradigm) new algorithmic tools to use these properties efficiently.

My main contributions deal with :

- the characterization of graphs with specific structures. My study of graph searching allowed to generalize some duality results of tree-decompositions. My study of cops and robber games allowed me to obtain new characterizations of several graphs classes ;
- the design of efficient algorithms using the proposed characterizations. For instance, I am working on compact routing schemes in graphs with bounded chordality or hyperbolicity ;
- the study of the routing reconfiguration problem in WDM networks. To model this problem in terms of digraph searching game allows to take advantage of the structure of these networks to obtain efficient solutions ;
- in distributed and dynamic environments, it is important to use simple data structures that can be updated easily. I am interested in the amount of local information needed to design efficient distributed algorithm.

I use various tools of discrete mathematics, probabilities and combinatorial optimization. My publications are the result of collaborations with students I supervise, members of COATI and researchers from other universities.

Creation of the international workshop IMAGINE*

International workshop on **M**obility, **A**lgorithms and **G**raph theory **I**n dynamic **N**ETworks

In collaboration with Nathalie Mitton (INRIA Research Officer, Lille) et David Ilcinkas (CNRS Research Officer, Bordeaux), **I created and organized** the international workshop IMAGINE.

This workshop aims at letting junior researchers around the world know each other and to have a larger view of the recent results of their peers, in order to favor future collaboration.

It is totally managed by junior researchers (Ph.D. students or people who has defended their thesis for no more than 2 years) relative to the area of dynamic wireless networks, evaluated by junior researchers. Obviously, any researcher can attend it.

Third past editions.

1. **PC-chair** of the first edition colocated with DISC 2007, Chypre, Sept. 26-27th 2007.
 2. Second edition colocated with ICALP 2008, Reykjavik, Islande, July 12th 2008.
 3. Third edition colocated with SIROCCO 2009, Piran, Slovenia, May 28th 2009.
-

Participation to conference Program Committees / Organisation

AlgoTel'14, 16mes Rencontres Francophones sur les Aspects Algorithmiques de Télécommunications, Ile de Ré, 2014.

GRASTA'14, 6th Workshop on GRAPh Searching, Theory and Applications, France, 2014. (**organizing chair**)

OPODIS'13, 17th International Conference On Principles Of DIstributed Systems (**conference chair**), Nice, December 2013

AlgoTel'13, 15mes Rencontres Francophones sur les Aspects Algorithmiques de Télécommunications (**co-PC chair**), Pornic, 2013.

TERA-NET'11, Toward Evolutive Routing Algorithms for scale-free/internet-like NETworks, Roma, 2011. (member of the program committee)

AlgoTel'11, 13mes Rencontres Francophones sur les Aspects Algorithmiques de Télécommunications (**co-organizing chair**), Agay, 2011.

TERA-NET'10, Toward Evolutive Routing Algorithms for scale-free/internet-like NETworks (co-chair), Bordeaux, 2010.

MajecSTIC'10, MANifestation des JEunes Chercheurs en Sciences et Technologies de l'Information et de la Communication, Bordeaux, 2010.

JDIR'10, 11th Journées Doctorales en Informatique et Réseaux, Sophia Antipolis, 2010.

Selection Committees

- Member of Comité de sélection 27 MCF 0532, Univ. de la Méditerranée, 2011.
- Member of Comité de sélection 27 MCF 0695, Univ. de Montpellier 2, 2011.

Students supervision

Ph.D. students

- Ronan Pardo Soares (since Nov. 2010, defended Nov. 8th 2013), *Routing Reconfiguration in WDM Networks*.
- Bi Li (since Oct. 2011), *Study of Internet model and its properties for efficient routing algorithms*.

Master/Undergraduate students

- Undergraduate internship of Klaus Jaschan (Dec 2013-Feb 2014)
- Master 1 internship of Ioannis Lamprou, co-sup. with S. Pérennes (April- August 2013)
- Master 1 internship of Christos Papageorgakis (March-July 2013)
- Undergraduate internship of Mélanie Ducoffe (June-July 2012)
- Master 2 internship of Dang Dinh Khanh (Mar.-Aug 2011)
- Undergraduate intern. of Henry Wei Cheng HSU, co-sup. with D. Coudert (Apr.-Aug 2010)
- Undergraduate internship of Sonia Belhareth, co-sup. with D. Coudert (Jan.-May. 2010)
- Undergraduate internship of Saber Bennejma, co-sup. with D. Coudert (Sept-Dec. 2009)
- Master 2 of Ronan Soares, co-supervision with D. Coudert (March-May 2009)
- Undergraduate intern. of Matthieu Rajoelison, co-sup. with P. Berthomé (March-May 2007)

Participation to national and international projects

- | | |
|-------------|--|
| 2013 - | Coordinator of Inria Equipes associées AlDyNet, Univ. Adolfo Ibáñez (Chile) |
| 2013 - | Coordinator of Action ECOS-SUD, Chile |
| 2013 - | Member of the project ANR STINT |
| 2010 - | Member of the European project FP7 STEP EULER |
| 2004 - | Member of ResCom, GdR CNRS "ASR" |
| 2009 - 2013 | Member of the project ANR AGAPE |
| 2009 - 2012 | Member of the project ANR DIMAGREEN |
| 2006 - 2010 | Member of the project ANR ALPAGE |
| 2009 - 2010 | Member of the DCR-project (Collaboration Alcatel-Lucent belgium/ INRIA) |
| 2008 - 2010 | Involved in the project AEOLUS IST/FET Project |
| 2005 - 2009 | Involved in the Action COST 295 "DYNAMO" |
| 2007 - 2008 | Member of the project Anillo en Redes |
| 2004 - 2007 | Member of the ACI FRAGILE |
| 2004 - 2006 | Member of the ACI PairAPair |

Reviews

Reviews for journals

Theory of Computing Systems, Theoretical Computer Science, Distributed Computing, Discrete Mathematics, Discrete Applied Mathematics, SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, Journal of Combinatorial Optimization, Computer Networks, Transactions on Parallel Distributed Systems, Techniques et Science Informatiques, Transactions on Algorithms

Conference Reviews

- 2014, STACS, PODC, AlgoTel
 - 2013, SOFSEM, CIAC, SEA, WG, SIROCCO
 - 2012, SEA, MFCS
 - 2011, AlgoTel, SIROCCO
 - 2010, ESA, FUN, SIROCCO, WG, AlgoTel, MajecSTIC, JDIR
 - 2009, OPODIS, SIROCCO, WG, AlgoTel, MFCS
 - 2008, SODA, WG, COCOA, OPODIS
 - 2007, STACS, AlgoTel
 - 2006, STACS, DISC, SSS, AlgoTel
 - 2005, DISC, WG
-

Presentations

International meetings

Invited Talks

- EURO 2013, Roma, Italia, July 4th, 2013.
- GRASTA 2012, Banff, Canada, October 11th, 2012
- IMSA Workshop on Algorithms and Randomness, Santiago, Chile, January 18th, 2011
- EURO 2010, Lisbon, Portugal, July 14th, 2010
- GRASTA 2008, Redonda, Ceará, Brasil, February 27th, 2008
- GRASTA 2006, Anogia, Crete, October 10th, 2006

Conferences

- STACS 2014, Lyon, France, March 6th, 2014
- ICDCN 2014, Coimbatore, India, January 5th, 2014
- SIROCCO 2013, Ischia, Italia, July 1st, 2013
- FCC 2010, Orsay, France, June 28th, 2010
- AGT 2009, Warwick, Great Britain, March 24th 2009
- Workshop COST 293 GRAAL, Arcachon, France, Sept. 25th 2008 (selection on abstract)
- WG 2007, Dornburg, Germany, June 21st, 2007
- SIROCCO 2006, Chester, Great Britain, July 3rd, 2006
- WG 2006, Bergen, Norway, June 23rd, 2006
- LATIN 2006, Valdivia, Chile, March 21st, 2006
- MFCS 2005, Gdansk, Poland, September 1st, 2005

Seminaries

- AIDyNet Seminar, Univ. Adolfo Ibanez, Santiago, Chile, November 21st, 2013
- IMSA Seminar, Univ. Adolfo Ibanez, Santiago, Chile, August 10th, 2012
- Plenary meeting EULER, Ghent, Belgium, June 6th, 2012
- Seminar team ParGO, Univ. federal do Ceara, Fortaleza, Brazil, April 9th, 2010
- Seminar of the project Anillo en Redes (DIM), Santiago, Chile, August 22nd, 2008
- Seminar of the project Anillo en Redes (DIM), Santiago, Chile, October 12th, 2007

Meetings

- GRASTA 2011, Dagstuhl, Germany, February 17th, 2011
- JCALM 2009, Sophia Antipolis, France, October 19th, 2009
- JCALM 2007, Montpellier, France, April 27th, 2007
- GROW 2005, Prague, Czech Republic, October 19th, 2005

National meetings

Conferences

- AlgoTel 2012, La Grande Motte, May 31st, 2012
- AlgoTel 2010, Belle Dune, 3 juin 2010
- AlgoTel 2008, Saint Malo, 14th May 2008
- AlgoTel 2007, Ile d'Oléron, 30th May 2007
- AlgoTel 2006, Trégastel, 11th May 2006
- AlgoTel 2005, Presqu'île de Giens, 11th May 2005

Seminaries

- Seminar of the project COATI, INRIA Sophia Antipolis, February 11th, 2014.
- Seminar of the project COATI, INRIA Sophia Antipolis, July 16th, 2013.
- Seminar of the project COATI, INRIA Sophia Antipolis, March 5th, 2013.
- Seminar of the team CRO, LIF, Marseille, Feb. 20th, 2012
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, France, October 25th, 2011
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, France, July 12th, 2011
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, France, March 15th, 2011
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, France, November 2nd, 2010
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, France, January 12th, 2010
- Seminar of the team Graphes et applications, LaBRI, Bordeaux, March 13th 2009
- Seminar of the LIFL, Lille, March 5th 2009
- Seminar of the team CRO, LIF, Marseille, Dec. 15th, 2008
- Seminar of the team MoVe, LIF, Marseille, Octobre 30th, 2008
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, France, October 9th, 2008
- Seminar of the team GraphComb, LRI, Orsay, May 25th, 2007
- Seminar of the team Graphes et applications, LaBRI, Bordeaux, May 11th, 2007
- Seminar of the project MASCOTTE, INRIA Sophia Antipolis, December 19th, 2006
- Seminar of the team MC2, LIP, Lyon, April 12th, 2006
- Seminar of the team GrafComm, LRI, Orsay, January 13th, 2006
- Seminar of the team GrafComm, LRI, Orsay, February 18th, 2005

Meetings

- Réunion ADR Network science, LINCS, Paris, February 28th, 2013.
- Journées Graphes et Algorithmes 2011, Sophia Antipolis, November 18th, 2011
- Réunion INRIA/Alcatel Lucent Bel/LaBRI, Bordeaux, December 3rd, 2009
- Réunion ALADDIN, Bordeaux, November 27th, 2009
- Réunion INRIA/Alcatel Lucent Bel/LaBRI, Carry-le-Rouet, June 15th, 2009
- Journées Graphes et Algorithmes 2008, Sophia Antipolis, November 6th 2009
- Réunion FRAGILE, Paris, 19 juin 2007
- Journées Graphes et Algorithmes 2006, Orléans, November 9th, 2006
- Réunion FRAGILE, Oléron, September 7th, 2006
- Journées ResCom, Lille, March 6th, 2006
- Journées Graphes et Algorithmes 2005, Bordeaux, November 3rd, 2005
- Réunion FRAGILE, Aussois, March 23rd, 2005
- Réunion TAROT, Lyon, October 14th, 2004
- Journées Graphes et Algorithmes 2004, Grenoble, September 29th, 2004