# Laurent Doyen

Curriculum Vitae

February 2024


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| Name : | **Doyen** |
| First Name : | **Laurent R.** |
| Place/Date of birth : | Brussels, Belgium - November 1979 [44 years] |
| Citizenship : | Belgian |
| Address (office) : | Laboratoire Méthodes Formelles (LMF),<br>École Normale Supérieure Paris-Saclay (ENS Paris-Saclay)<br>CNRS UMR 9021<br>4, av. des sciences<br>91190 Gif-sur-Yvette<br>France |
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**Current position**

CNRS researcher, École Normale Supérieure Paris-Saclay, France.

**Research Interests**

- Formal methods for the design and verification of embedded systems.
- Theory of computation, automata theory, model-checking, games.
- Quantitative and probabilistic verification.
- Real-time and hybrid systems.

**Content**

# 1 Education

- 2012 — HDR (Habilitation), École Normale Supérieure de Cachan, France.
  Title : *Games and Automata : From Boolean to Quantitative Verification.*
- 2002 - 2006 — PhD, Computer Science, Université Libre de Bruxelles (ULB), Belgium.
  Title : *Algorithmic Analysis of Complex Semantics for Timed and Hybrid Automata.*
  Thesis advisor : Prof. Jean-François Raskin.
- 2003 — DEA (Advanced studies) in Computer Science, Université Libre de Bruxelles (ULB), Belgium.
- 1997 - 2002 — Civil Engineering degree, Computer Science with mention *magna cum laude*[1] every year, Université Libre de Bruxelles (ULB), Belgium.

# 2 Academic Employment

- since Oct 2009 — **Permanent researcher** (Chargé de recherche CNRS), supported by the French National Science Foundation (CNRS), LMF, ENS Paris-Saclay (formerly LSV, ENS Cachan).
- Oct 2008 - Sep 2009 — **Postdoctoral researcher**, supported by a grant of the Belgian National Science Foundation (FNRS), Université Libre de Bruxelles (ULB). Prof. Jean-François Raskin.
- Oct 2006 - Sep 2008 — **Postdoctoral researcher**, Ecole Polytechnique Fédérale de Lausanne (EPFL). Prof. Thomas A. Henzinger.
- Oct 2002 - Sep 2006 — **PhD student** supported by a grant of the Belgian National Science Foundation (FNRS), Université Libre de Bruxelles (ULB). Prof. Jean-François Raskin.
- Oct 1999 - Sep 2002 — **Tutor** for the course 'Calculus I' by Prof. Anne Delandtsheer, Université Libre de Bruxelles (ULB).

# 3 Projects and grants

- Jan 2018 - Dec 2018 — Rutherford grant for visiting the University of Warwick and the Alan Turing Institute (UK). Collaboration with Prof. Marcin Jurdzinski on fast algorithms for synthesis of safe, smart, and adaptative controllers.
  Budget : GBP 22,500.-
- Jan 2013 - Dec 2015 — Principal Investigator, 3-year grant "PICS - Projet International de Collaboration Scientifique" on *Quantitative Verification* funded by CNRS. Bilateral collaboration with Prof. Thierry Massart (ULB Brussels, Belgium).
  Budget : EUR 15,000.-
- June 2008 — ESF AutoMathA grant to visit the research group on Mathematical Foundations of Computer Science of RWTH Aachen, Germany.

# 4 Theses

- Laurent Doyen. **Games and Automata : From Boolean to Quantitative Verification**. *Habilitation thesis*, École Normale Supérieure de Cachan, 2012.
- Laurent Doyen. **Algorithmic Analysis of Complex Semantics for Timed and Hybrid Automata**. PhD Thesis, Université Libre de Bruxelles, 2006.
- Laurent Doyen. **A systematic implementation of simple timed controllers**. DEA Thesis, Université Libre de Bruxelles, 2003.
- Laurent Doyen. **Conception et vérification d'applications distribuées pour les robots Lego-Mindstorms**. M. thesis, Université Libre de Bruxelles, 2002.

1. Grande Distinction.

# 5 Publications : 2 + 21 + 55 + 2 = 80

## 5.1 Book chapters : 2

[B2] Laurent Doyen, Goran Frehse, George J. Pappas, and André Platzer. **Verification of Hybrid Systems**. Handbook of Model-Checking, pp. 1047-1110, Springer, 2018.

[B1] Laurent Doyen and Jean-François Raskin. **Games with Imperfect Information : Theory and Algorithms**. Lectures in Game Theory for Computer Scientists, pp. 185-212, Cambridge University Press, 2011.

## 5.2 Refereed international journals : 21

2023

[J21] Laurent Doyen. **Stochastic Games with Synchronization Objectives**. *Journal of the ACM* 70(3) 23 :1-35, 2023.

[J20] Dietmar Berwanger and Laurent Doyen. **Observation and Distinction. Representing Information in Infinite Games**. *Theory of Computing Systems* 67(1) :4-27, Springer, 2023.

2022

[J19] Krishnendu Chatterjee and Laurent Doyen. **Graph Planning with Expected Finite Horizon**. *Journal of Computer and System Sciences* 129 :1-21, Elsevier, 2022.

2019

[J18] Laurent Doyen, Thierry Massart, and Mahsa Shirmohammadi. **The Complexity of Synchronizing Markov Decision Processes**. *Journal of Computer and System Sciences* 100 :96-129, Elsevier, 2019.

2017

[J17] Krishnendu Chatterjee, Laurent Doyen, Emmanuel Filiot, and Jean-François Raskin. **Doomsday Equilibria for Omega-Regular Games**. *Information and Computation* 254 :296-315, Elsevier, 2017.

2015

[J16] Krishnendu Chatterjee, Laurent Doyen, Hugo Gimbert, and Thomas A. Henzinger. **Randomness for Free**. *Information and Computation* 245 :3-16, Elsevier, 2015.

[J15] Krishnendu Chatterjee, Laurent Doyen, Mickael Randour, and Jean-François Raskin. **Looking at Mean-Payoff and Total-Payoff Through Windows**. *Information and Computation* 242 :25-52, Elsevier, 2015.

[J14] Yaron Velner, Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger, Alexander Rabinovich, and Jean-François Raskin. **The Complexity of Multi-Mean-Payoff and Multi-Energy Games**. *Information and Computation* 241 :177-196, Elsevier, 2015.

2014

[J13] Krishnendu Chatterjee and Laurent Doyen. **Partial-Observation Stochastic Games : How to Win when Belief Fails**. *ACM Transactions on Computational Logic* 15 :2, 2014.

2013

[J12] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **A Survey of Partial-Observation Stochastic Parity Games**. *Formal Methods in System Design*, vol. 43(2), pp. 268-284, Springer-Verlag, 2013.

2012

[J11] Krishnendu Chatterjee and Laurent Doyen. **Energy Parity Games**. *Theoretical Computer Science*, vol. 458, pp. 49-60, Elsevier, 2012.

2011

[J10] Luboš Brim, Jakub Chaloupka, Laurent Doyen, Raffaella and Gentilini, and Jean-François Raskin. **Faster algorithms for mean-payoff games**. *Formal Methods in System Design*, vol. 38(2), pp. 97-118, Springer-Verlag, 2011.

2010

[J9] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Expressiveness and Closure Properties for Quantitative Languages** *Logical Methods in Computer Science*, vol. 6(3 :10), 2010.

[J8] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Quantitative Languages**. *ACM Transactions on Computational Logic* 11 :4, 2010.

[J7] Dietmar Berwanger, Krishnendu Chatterjee, Martin De Wulf, Laurent Doyen, and Thomas A. Henzinger. **Strategy construction for parity games with imperfect information**. *Information and Computation* 208(10) :1206-1220, Elsevier, 2010.

2009

[J6] Laurent Doyen and Jean-François Raskin. **Antichains for the Automata-Based Approach to Model-Checking**. *Logical Methods in Computer Science*, vol. 5(1 :5), 2009.

2008

[J5] Martin De Wulf, Laurent Doyen, Nicolas Markey and Jean-François Raskin. **Robust Safety of Timed Automata**. *Formal Methods in System Design*, vol. 33(1-3), pp. 45-84, Springer-Verlag, 2008.

[J4] Laurent Doyen, Thomas A. Henzinger, and Jean-François Raskin. **Equivalence of Labeled Markov Chains**. *International Journal of Foundations of Computer Science* 19(3) :549-563, World Scientific, 2008.

2007

[J3] Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Jean-François Raskin. **Algorithms for Omega-Regular games with Incomplete Information**. *Logical Methods in Computer Science*, vol. 3(3 :4), 2007.

[J2] Laurent Doyen. **Robust parametric reachability for timed automata**. *Information Processing Letters* 102(5) :208-213, Elsevier 2007.

2005

[J1] Martin De Wulf, Laurent Doyen and Jean-François Raskin. **Almost ASAP Semantics : From Timed Models to Timed Implementations**. In *Formal Aspects of Computing*, vol. 17(3), pp. 319-341, Springer-Verlag, 2005.

## 5.3 Proceedings of refereed international conferences : 55

2024

[C55] Laurent Doyen, Pranshu Gaba, and Shibashis Guha. **Stochastic Window Mean-Payoff Games**. To appear in Proceedings of the 27th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS), Springer 2024.

2022

[C54] Laurent Doyen. **Stochastic Games with Synchronizing Objectives**. Proceedings of the 37th Annual Symposium on Logic in Computer Science (LICS), IEEE, Haifa, 2022. (12 pages)

[C53] Laurent Doyen and Marie van den Bogaard. **Bounds for Synchronizing Markov Decision Processes**. Proceedings of the 17th International Computer Science Symposium in Russia (CSR), LNCS 13296, Springer, 2022. (19 pages)

2021

[C52] Krishnendu Chatterjee and Laurent Doyen. **Stochastic Processes with Expected Stopping Time**. Proceedings of the 36th Annual Symposium on Logic in Computer Science (LICS), IEEE, Rome, 2021. (13 pages)

2020

[C51] Dietmar Berwanger and Laurent Doyen. **Observation and Distinction. Representing Information in Infinite Games**. Proceedings of the 37th International Symposium on Theoretical Aspects of Computer Science (STACS), LIPIcs, Schloss Dagstuhl proceedings, Montpellier, 2020. (13 pages)

2019

[C50] Krishnendu Chatterjee and Laurent Doyen. **Graph Planning with Expected Finite Horizon**. Proceedings of the 34th Annual Symposium on Logic in Computer Science (LICS), IEEE, Vancouver, 2019. (12 pages)

2017

[C49] Laurent Doyen. **The Multiple Dimensions of Mean-Payoff Games**. Proceedings of the 11th International Workshop on Reachability Problems (RP), LNCS 10506, London, 2017. (8 pages)

[C48] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **The Cost of Exactness in Quantitative Reachability**. Models, Algorithms, Logics and Tools - Essays Dedicated to Kim G. Larsen on the Occasion of His 60th Birthday, LNCS 10460, 2017. (15 pages)

2016

[C47] Krishnendu Chatterjee and Laurent Doyen. **Computation Tree Logic for Synchronization Properties**. Proceedings of the 43rd International Colloquium on Automata, Languages and Programming (ICALP), LIPIcs, Schloss Dagstuhl proceedings, Rome, 2016. (14 pages)

[C46] Krishnendu Chatterjee and Laurent Doyen. **Perfect-Information Stochastic Games with Generalized Mean-Payoff Objectives**. Proceedings of the 31st Annual Symposium on Logic in Computer Science (LICS), IEEE, New York City, 2016. (10 pages)

2015

[C45] Krishnendu Chatterjee, Laurent Doyen, and Moshe Y. Vardi. **The Complexity of Synthesis from Probabilistic Components**. Proceedings of the 42nd International Colloquium on Automata, Languages and Programming (ICALP), LNCS 8573, Springer, 2015. (12 pages)

2014

[C44] Laurent Doyen, Line Juhl, Kim G. Larsen, Nicolas Markey, and Mahsa Shirmohammadi. **Synchronizing Words for Weighted and Timed Automata**. Proceedings of the 34h International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), LIPIcs, Schloss Dagstuhl proceedings, New Delhi, 2014. (12 pages)

[C43] Laurent Doyen, Thierry Massart, and Mahsa Shirmohammadi. **Robust Synchronization in Markov Decision Processes**. Proceedings of the 25th International Conference on Concurrency Theory (CONCUR), LNCS 8704, Rome, 2014. (15 pages)

[C42] Krishnendu Chatterjee and Laurent Doyen. **Games with a Weak Adversary**. Proceedings of the 41st International Colloquium on Automata, Languages and Programming (ICALP), LNCS 8573, Copenhagen, 2014. (12 pages)

[C41] Laurent Doyen, Thierry Massart, and Mahsa Shirmohammadi. **Limit Synchronization in Markov Decision Processes**. Proceedings of the 17th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS), LNCS 8412, Grenoble, 2014. (15 pages)

[C40] Krishnendu Chatterjee, Laurent Doyen, Hugo Gimbert, and Youssouf Oualhadj. **Perfect-Information Stochastic Mean-Payoff Parity Games**. Proceedings of the 17th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS), LNCS 8412, Grenoble, 2014. (16 pages)

[C39] Krishnendu Chatterjee, Laurent Doyen, Sumit Nain, and Moshe Y. Vardi. **The Complexity of Partial-Observation Stochastic Parity Games with Finite-Memory Strategies**. Proceedings of the 17th International Conference on Foundations of Software Science and Computation Structures (FoSSaCS), LNCS 8412, Grenoble, 2014. (16 pages)

[C38] Krishnendu Chatterjee, Laurent Doyen, Emmanuel Filiot, and Jean-François Raskin. **Doomsday Equilibria for Omega-Regular Games**. Proceedings of the 15th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI), LNCS 8318, San Diego, 2014. (20 pages)

2013

[C37] Krishnendu Chatterjee, Laurent Doyen, Mickael Randour, and Jean-François Raskin. **Looking at Mean-Payoff and Total-Payoff through Windows**. Proceedings of the 11th International Symposium on Automated Technology for Verification and Analysis (ATVA), LNCS 8172, Hanoi, 2013. (15 pages)

[C36] Thomas Brihaye, Laurent Doyen, Gilles Geeraerts, Joël Ouaknine, Jean-François Raskin, and James Worrell. **Time-Bounded Reachability for Monotonic Hybrid Automata : Complexity and Fixed Points**. Proceedings of the 11th International Symposium on Automated Technology for Verification and Analysis (ATVA), LNCS 8172, Hanoi, 2013. (16 pages)

2012

[C35] Krishnendu Chatterjee and Laurent Doyen. **Partial-Observation Stochastic Games : How to Win when Belief Fails**. Proceedings of 27th Annual IEEE Symposium on Logic in Computer Science (LICS), IEEE, Dubrovnik, 2012. (10 pages)

2011

[C34] Thomas Brihaye, Véronique Bruyère, Laurent Doyen, Marc Ducobu, and Jean-François Raskin. **Antichain-based QBF Solving**. Proceedings of the 9th International Symposium on Automated Technology for Verification and Analysis (ATVA), LNCS 6996, Taiwan, 2011. (15 pages)

[C33] Krishnendu Chatterjee, Laurent Doyen, and Rohit Singh. **On Memoryless Quantitative Objectives**. Proceedings of the 18th International Symposium on Fundamentals of Computation Theory (FCT), LNCS 6914, Oslo, 2011. (12 pages)

[C32] Laurent Doyen, Thierry Massart, and Mahsa Shirmohammadi. **Infinite Synchronizing Words for Probabilistic Automata** Proceedings of the 36th International Symposium on Mathematical Foundations of Computer Science (MFCS), LNCS 6907, Warsaw, 2011. (12 pages)

[C31] Krishnendu Chatterjee and Laurent Doyen. **Energy and Mean-Payoff Parity Markov Decision Processes**. Proceedings of the 36th International Symposium on Mathematical Foundations of Computer Science (MFCS), LNCS 6907, Warsaw, 2011. (13 pages)

[C30] Thomas Brihaye, Laurent Doyen, Gilles Geeraerts, Joël Ouaknine, Jean-François Raskin, and James Worrell. **On Reachability for Hybrid Automata over Bounded Time**. Proceedings of the 38th International Colloquium on Automata, Languages and Programming (ICALP), LNCS 6756, Zürich, 2011. (12 pages)

2010

[C29] Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger, and Jean-François Raskin. **Generalized Mean-payoff and Energy Games**. Proceedings of the 30th International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), LIPIcs, Schloss Dagstuhl proceedings, Chennai, 2010. (12 pages)

[C28] Krishnendu Chatterjee and Laurent Doyen. **The Complexity of Partial-Observation Parity Games**. Proceedings of the 17th International Conference on Logic for Programming, Artificial Intelligence, and Reasoning (LPAR), LNCS 6397, Yogyakarta, 2010. (14 pages)

[C27] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Qualitative Analysis of Partially-observable Markov Decision Processes**. Proceedings of the 35th International Symposium on Mathematical Foundations of Computer Science (MFCS), LNCS 6281, Brno, 2010. (12 pages)

[C26] Krishnendu Chatterjee, Laurent Doyen, Hugo Gimbert, and Thomas A. Henzinger. **Randomness for Free**. Proceedings of the 35th International Symposium on Mathematical Foundations of Computer Science (MFCS), LNCS 6281, Brno, 2010. (12 pages)

[C25] Krishnendu Chatterjee, Laurent Doyen, Herbert Edelsbrunner, Thomas A. Henzinger, and Philippe Rannou. **Mean-Payoff Automaton Expressions**. Proceedings of the 21st International Conference on Concurrency Theory (CONCUR), LNCS 6269, Paris, 2010. (15 pages)

[C24] Aldric Degorre, Laurent Doyen, Raffaella Gentilini, Jean-François Raskin, and Szymon Toruńczyk. **Energy and Mean-Payoff Games with Imperfect Information**. Proceedings of the 24th International Conference on Computer Science Logic (CSL), LNCS 6247, Brno, 2010. (15 pages)

[C23] Krishnendu Chatterjee and Laurent Doyen. **Energy Parity Games**. Proceedings of the 37th International Colloquium on Automata, Languages and Programming (ICALP), LNCS 6199, Bordeaux, 2010. (12 pages)

[C22] Laurent Doyen, Thomas A. Henzinger, Axel Legay, and Dejan Ničković. **Robustness of Sequential Circuits**. Proceedings of the 10th International Conference on Application of Concurrency to System Design (ACSD), IEEE Computer Society Press, Braga, 2010. (8 pages)

[C21] Laurent Doyen and Jean-François Raskin. **Antichains Algorithms for Finite Automata**. Proceedings of the 16th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), LNCS 6015, Paphos, 2010. (21 pages)

2009

[C20] Laurent Doyen, Gilles Geeraerts, Jean-François Raskin, and Julien Reichert. **Realizability of Real-Time Logics**. Proceedings of 7th International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS), LNCS 5813, Budapest, 2009. (15 pages)

[C19] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Probabilistic Weighted Automata**. Proceedings of 19th International Conference on Concurrency Theory (CONCUR), LNCS 5710, Bologna, 2009. (15 pages)

[C18] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Alternating Weighted Automata**. Proceedings of 17th International Symposium on Fundamentals of Computation Theory (FCT), LNCS 5699, Wrocław 2009. (12 pages)

[C17] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **A Survey of Stochastic Games with Limsup and Liminf Objectives**. Proceedings of 36th International Colloquium on Automata, Languages and Programming (ICALP), LNCS 5556, Rhodes, 2009. (15 pages)

[C16] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Expressiveness and Closure Properties for Quantitative Languages**. Proceedings of 24th Annual IEEE Symposium on Logic in Computer Science (LICS), IEEE, Los Angeles, 2009. (10 pages)

[C15] Dietmar Berwanger, Krishnendu Chatterjee, Martin De Wulf, Laurent Doyen, and Thomas A. Henzinger. **Alpaga : A Tool for Solving Parity Games with Imperfect Information**. Proceedings of 15th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), LNCS 5505, York, 2009. (4 pages)

2008

[C14] Dietmar Berwanger and Laurent Doyen. **On the Power of Imperfect Information**. Proceedings of 28th International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), Dagstuhl Seminar Proceedings, Bangalore, 2008. (10 pages)

[C13] Martin De Wulf, Laurent Doyen, Nicolas Maquet and Jean-François Raskin. **Alaska : Antichains for Logic, Automata and Symbolic Kripke structure Analysis**. Proceedings of the 6th International Symposium on Automated Technology for Verification and Analysis (ATVA), LNCS 5311, Seoul, 2008. (6 pages)

[C12] Laurent Doyen, Thomas A. Henzinger, Barbara Jobstmann, and Tatjana Petrov. **Interface Theories with Component Reuse**. Proceedings of the 8th Annual Conference on Embedded Software (EMSOFT), ACM Press, Atlanta, 2008. (9 pages)

[C11] Krishnendu Chatterjee, Laurent Doyen, and Thomas A. Henzinger. **Quantitative Languages**. Proceedings of the 17th International Conference on Computer Science Logic (CSL), LNCS 5213, Bertinoro, 2008. (16 pages)

[C10] Dietmar Berwanger, Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger, and Sangram Raje. **Strategy Construction for Parity Games with Imperfect Information**. Proceedings of the 18th International Conference on Concurrency Theory (CONCUR), LNCS 5201, Toronto, 2008. (15 pages)

[C9] Martin De Wulf, Laurent Doyen, Nicolas Maquet and Jean-François Raskin. **Antichains : Alternative Algorithms for LTL Satisfiability and Model-Checking**. Proceedings of the 14th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), LNCS 4963, Budapest, 2008. (15 pages)

2007

[C8] Laurent Doyen and Jean-François Raskin. **Improved Algorithms for the Automata-Based Approach to Model-Checking** Proceedings of the 13th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), LNCS 4424, Braga, 2007. (15 pages)

2006

[C7] Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Jean-François Raskin. **Algorithms for Omega-Regular games with Incomplete Information** Proceedings of the 15th International Conference on Computer Science Logic (CSL), LNCS 4207, Szeged, 2006. (16 pages)

[C6] Martin De Wulf, Laurent Doyen, Thomas A. Henzinger and Jean-François Raskin. **Antichains : A New Algorithm for Checking Universality of Finite Automata**. Proceedings of the 18th International Conference on Computer-Aided Verification (CAV), LNCS 4144, Seattle, 2006. (14 pages)

[C5] Martin De Wulf, Laurent Doyen and Jean-François Raskin. **A Lattice Theory for Solving Games of Imperfect Information**. Proceedings of 9th International Workshop on Hybrid Systems : Computation and Control (HSCC), LNCS 3927, Santa Barbara, 2006. (16 pages)

2005

[C4] Laurent Doyen, Thomas A. Henzinger and Jean-François Raskin. **Automatic Rectangular Refinement of Affine Hybrid Systems**. Proceedings of the 3rd International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS), LNCS 3829, Uppsala, 2005. (18 pages)

[C3] Martin De Wulf, Laurent Doyen and Jean-François Raskin. **Systematic Implementation of Real-Time Models**. Proceedings of the 13th International Symposium on Formal Methods (FM), LNCS 3582, Newcastle upon Tyne, 2005. (18 pages)

2004

[C2] Martin De Wulf, Laurent Doyen, Nicolas Markey and Jean-François Raskin. **Robustness and Implementability of Timed Automata**. Proceedings of the Joint International Conferences on Formal Modelling and Analysis of Timed Systems and Formal Techniques in Real-Time and Fault-Tolerant Systems (FORMATS-FTRTFT), LNCS 3253, Grenoble, 2004. (16 pages)

[C1] Martin De Wulf, Laurent Doyen and Jean-François Raskin. **Almost ASAP Semantics : From Timed Models to Timed Implementations**. Proceedings of 7th International Workshop on Hybrid Systems : Computation and Control (HSCC), LNCS 2993, Philhadelphia, 2004. (15 pages)

## 5.4 Proceedings of refereed international workshops : 2

2011

[W2] Krishnendu Chatterjee and Laurent Doyen. **Games and Markov Decision Processes with Mean-payoff Parity and Energy Parity Objectives**. Proceedings of the 7th Doctoral Workshop on Mathematical and Engineering Methods in Computer Science (MEMICS), LNCS 7119, Lednice, 2011. (10 pages)

[W1] Laurent Doyen, Thierry Massart, and Mahsa Shirmohammadi. **Synchronizing Objectives for Markov Decision Processes**. Proceedings of International Workshop on Interactions, Games and Protocols (iWIGP), Electronic Proceedings in Theoretical Computer Science 50, 2011. (15 pages)

## 5.5 Award

- Distinguished paper [C8] selected among the best papers (co)authored by a student, 13th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2007.

# 6 Invited Lectures

**Invited Lectures at Summer Schools & Workshops**

- *The Multiple Dimensions of Mean-Payoff Games*, 11th International Workshop on Reachability Problems (RP 2017), London, UK, September 2017.
- *Games and Verification*, Journées annuelles du GT ALGA (Automata, Logic, Games and Algebra) et du GT Verif, Créteil, France, May 2017.
- *Quantitative Languages*, 7th International Workshop on Weighted Automata : Theory and Applications (WATA 2014), Leipzig, Germany, May 2014.
- *The Complexity of Partial-observation Stochastic Games*, 15th International Workshop on Verification of Infinite-State Systems (INFINITY 2013), Hanoi, Viet-Nam, October 2013.
- *Jeux et Vérification*, École Jeunes Chercheurs en Informatique et Mathématiques, Chambéry, France, March 2010.
- *Games for Controller Synthesis*, 8th International Summer School on Modeling and Verifying Parallel Processes (MOVEP), Nouan, France, June 2008.

**Tutorials at Dagstuhl seminar**

- *Quantitative Languages : Weighted Automata and Beyond*, Dagstuhl seminar 14041 on *Quantitative Models : Expressiveness, Analysis, and New Applications*, Germany, 19 - 24 January 2014.
- *Games in System Design : Tutorial and Survey*, Dagstuhl seminar 12461 on *Games and Decisions for Rigorous Systems Engineering*, Germany, 11 - 16 November 2012.

**Lectures at Workshops**

- *Partial-Observation Stochastic Games : How to Win When Belief Fails*, 2nd Workshop on Games, Logic and Security (GiPSy), Rennes, France, 25-27 October 2011.
- *How Much Memory is Needed to Win in Partial-Observation Games*, 10th Workshop on Games for Design and Verification (GAMES), Paris, France, 31 August - 3 September 2011.
- *Randomness for Free*, 2nd Workshop on Timed and Infinite Systems, Warwick, UK, 29-30 March 2010.
- *Energy and Mean-Payoff Games*, 2nd International Workshop on Automata, Concurrency and Timed Systems (ACTS), Chennai Mathematical Institute, India, 1-3 February 2010.
- *Imperfect-Information Games for System Design. Models, Applications, and Tools*, 1st International Workshop on Practical Synthesis for Concurrent Systems (PSY), co-located with CAV, Grenoble, France, 28th June 2009.

**Other Invited Lectures**

- *Stochastic Games with Synchronizing Objectives*, Séminaire de l'équipe Méthodes et Modèles Formelles, LaBRI, Université de Bordeaux, October 4th, 2022.
- *Observation and Distinction. Representing Information in Infinite Games*, Verification seminar, IRIF, Université de Paris, May 10th, 2021.
- *Expected Finite Horizon*, Verification seminar, IRIF, Université de Paris, October 14th, 2019.
- *Graph Planning with Expected Finite Horizon*, DIMAP seminar, University of Warwick, December 17th, 2018.
- *Graph Planning with Expected Finite Horizon*, Seminar Automata Theory, University of Warsaw, November 14th, 2018.
- *Graph Planning with Expected Finite Horizon*, Henzinger group seminar, IST Austria, April 24th, 2018.
- *Partial-Observation Stochastic Games : How to Win when Belief Fails*, Dagstuhl seminar on Software Synthesis, April 9-13, 2012.
- *Partial-Observation Stochastic Games : How to Win when Belief Fails*, Université de Luxembourg, December 8th 2011.
- *Partial-Observation Stochastic Games : How to Win when Belief Fails*, Seminar *Graph and Logic* of the Laboratoire Bordelais de Recherche en Informatique (LaBRI), Université de Bordeaux, France, December 6th 2011.
- *Energy and Mean-Payoff Games*, RISE seminar IST Austria, 10 March 2011.

- *Energy and Mean-Payoff Games*. Seminar *Graph and Logic* of the Laboratoire Bordelais de Recherche en Informatique (LaBRI), Université de Bordeaux, France, December 16th 2010.
- *Quantitative Languages*. Seminar *Graph and Logic* of the Laboratoire Bordelais de Recherche en Informatique (LaBRI), Université de Bordeaux, France, June 9th 2009.
- *Staying Alive in the Dark*. Joint seminar of IST Austria & TU Vienna, February 12th 2010.
- *Quantitative Languages : Decision Problems, Expressive Power, and Closure Properties*. Seminar of the Laboratoire Spécification et Vérification (LSV), ENS Cachan, France, December 15th 2008.
- *Equivalence of labeled Markov chains*. Seminar in RWTH Aachen, Germany, June 10th 2008.
- *Equivalence of labeled Markov chains*. Seminar of the Laboratoire Spécification et Vérification (LSV), ENS Cachan, France, December 18th 2007.
- *A Lattice Theory for Solving Games of Imperfect Information*. Seminar of the Laboratoire Spécification et Vérification (LSV), ENS Cachan, France, January 31st 2006.
- *On the Implementability of Timed and Hybrid Systems*. TRESOR seminar (Thrust in Reliable Software Research), École Polytechnique Fédérale de Lausanne (EPFL), November 24th 2005.
- *Automatic Rectangular Refinement of Affine Hybrid Systems*. Seminar of the Centre Fédéré en Vérification, Univeristé Libre de Bruxelles, May 20th 2005.
- *Hybrid and Timed Automata : Formalisms for Real-Time*. Seminar for the Belgian inter-universitary DEA in mathematics organised by Samuel Fiorini, Univeristé Libre de Bruxelles, May 17th 2005.
- *A $\delta$-semantics for timed controllers*. Seminar of the Centre Fédéré en Vérification, Univeristé Libre de Bruxelles, May 3rd 2003.

# 7 Software

1. Alaska, a model-checker for finite automata, linear temporal logic and $\omega$-automata (since 2006) : written jointly by Martin De Wulf and Nicolas Maquet (in Python, 5000 LOC), based on [C6, C8, C9, C13] and on a prototype written by Laurent Doyen (in C, 1000 LOC). No longer maintained.
2. Alpaga, a solver for parity games of imperfect information (since 2008) : written by Martin De Wulf (in Python, 1000 LOC), based on [C7, J3, C10, C15] and on a prototype written by Sangram Raje. No longer maintained.

# 8 Review

- **Volume editor**
  1. Principles of Systems Design - Essays Dedicated to Thomas A. Henzinger on the Occasion of His 60th Birthday, LNCS 13660, Springer, co-editor (Festschrift with 31 invited papers), 2023.
  2. Theory of Computing Systems (Springer), guest editor for a special issue containing a selection of papers from STACS 2014.
- **Conference program committee**
  1. 51st Intl. Colloquium on Automata, Languages, and Programming (ICALP) track B, 2024 ;
  2. 39th Symposium on Logic in Computer Science (LICS), 2024 ;
  3. 16th Intl. Computer Science Symposium in Russia (CSR), 2021 ;
  4. 15th Intl. Conference on Language and Automata Theory and Applications (LATA), 2021 ;
  5. 14th Intl. Conference on Language and Automata Theory and Applications (LATA), 2020 ;
  6. Joint 23rd Annual Conference on Computer Science Logic (CSL) and 29th Symposium on Logic in Computer Science (LICS), 2014 ;
  7. 31st Symp. on Theoretical Aspects of Computer Science (STACS), 2014 ;
  8. 33rd Intl. Conf. on Foundations of Software Tech. and Theor. Comp. Sci. (FSTTCS), 2013 ;
  9. 8th Intl. Conf. on Formal Modelling and Analysis of Timed Systems (FORMATS), 2010 ;
- **Workshop program committee**
  1. Jewels of Automata : from Mathematics to Applications (AutoMathA), 2024 ;

2. 7th Intl. Symp. on Games, Automata, Logics and Formal Verification (GandALF), 2016 ;
3. 6th Intl. Symp. on Games, Automata, Logics and Formal Verification (GandALF), 2015 ;
4. 8th Intl. Workshop on Reachability Problems (RP), 2014 ;
5. Intl. Workshop on Quantities in Formal Methods (QFM), 2012 ;
6. 4th Interaction and Concurrency Experience Workshop (ICE), 2011 ;
7. 3rd Interaction and Concurrency Experience Workshop (ICE), 2010 ;

- **Journal & Conference referee** Several reviews every year for journals such as Journal of the ACM ; Logical Methods in Computer Science ; Information and Computation, Elsevier ; Int. J. on Software Tools for Technology Transfer, Springer ; Transactions on Computational Logic, ACM ; Transactions on Algorithms, ACM ; etc. and conferences such as CAV, CSL, ETAPS, ICALP, LICS, STACS, etc.

# 9 University Activities

## 9.1 Teaching

**Lecturer**

MPRI = Master Parisien de Recherche en Informatique (Paris Master of Research in CS).

- (2h) Guest lecture in *Préparation à l'Agrégation d'Informatique, Jeux en vérification*, 2024.
- (3h) Guest lecture in MPRI Course 2.20.1 "*Game theory in computer science*", 2023, 2024.
- (15h) MPRI Course 1.36 "*Introduction to Research*", 2014, 2015, 2016.
- (12h) MPRI Course 2.9 " *Verification of dynamic and parameterized systems*", Fall 2011.

**Teaching Assistant**

- (20h) for the course *Logique pour l'informatique*, Prof. Jean-François Raskin, ULB, 2009.
- (30h) for the course *Theoretical Computer Science III*, Prof. Thomas A. Henzinger, EPFL, 2006.
- (4x15h) for the course *Real-Time and Hybrid Systems : Analysis and Control*, Prof. Jean-François Raskin, ULB, 2002-2006.

## 9.2 Advising

Doctoral Students

- Thomas Soullard (ongoing, since 2021)
  *Sujet : Synthesis with Dynamical Information Flow.*
- Julien Reichert (Ph.D, ENS Cachan, 2015)
  *Reachability Games with Counters : Decidability and Algorithm*
  (co-advised with Dietmar Berwanger).
- Mahsa Shirmohammadi (Ph.D., ENS Cachan & ULB, 2014)
  *Qualitative Analysis of Probabilistic Synchronizing Systems*
  (co-advised with Thierry Massart).

PhD thesis referee (rapporteur) for

- Soumyajit Paul (*On the algorithmic complexity of two player zero-sum games of finite duration with imperfect information*, University of Bordeaux, 2023).
- Suman Sadhukhan (*A Verification Viewpoint on Network Congestion Games*, University of Rennes, 2021).
- Edon Kelmendi (*Two-Player Stochastic Games with Perfect and Zero Information*, University of Bordeaux, 2016).

PhD thesis jury member for

- Pierre Vandenhove (*Strategy Complexity of Zero-Sum Games on Graphs*, University of Mons (Belgium), 2023).
- Marie van den Bogaard (*Information-Flow Patterns in Games with Imperfect Information*, University Paris-Saclay, 2016).

Internship advisor at ENS Paris-Saclay (formerly ENS Cachan) for :

- (M2) Thomas Soullard (U. Orsay), *Observation and Distinction*, 4 months, 2021.
- Sriram Yenamandra (IIT Bombay, India), *Graph Planning with expected finite horizon and fixed variance*, 3 months, 2018.
- Marcel Moosbrugger (TU Vienna, Austria), *Reachability with expected finite horizon*, 1 months, 2018.
- Adwitee Roy (CMI, India), *Synchronizing words in weighted automata*, 3 months, 2016.
- Arjun Arul (CMI, India), *Robot games*, 3 months, 2012.
- (M2) Julien Reichert (ENS Cachan), *Décidabilité et complexité des jeux sur des systèmes à compteurs*, 4 months, 2011.
- Mahsa Shirmohammadi (ULB, Belgium), *Synchronizing Objectives for MDP*, 2 weeks, July 2010.
- Anas Nachid (U. Lorraine), *Développement prouvé d'un algorithme de vérification*, 10 weeks, Summer 2010 (co-advised with Stephan Merz, Loria Nancy).
- Benjamin Van der Maren, *Efficient algorithms for parity games of imperfect information*, 6 weeks, October 2009.

Undergraduate advisor at EPFL (semester projects) for :

- Philippe Rannou, *Decision Problems for Quantitative Languages*, April-August 2009.
- Christof Trunk, Bachelor thesis : *On Games of Imperfect Information*, March-June 2007.
- Sangram Raje, *A Tool for Solving Games of Imperfect Information*, May-July 2007.

Master thesis co-advisor at ULB, with Jean-François Raskin for :

- François Legros, *Vérification de contrôleurs Elastic : mise en pratique*, June 2004.
- Monir Azmani, *Implémentation d'algorithmes pour l'analyse de systèmes hybrides affins*, September 2006.

## 9.3 Support to research

- Head of the group *Model-checking and Synthesis* at LMF, ENS Paris-Saclay, 2021-present.
- Member of the *commission consultative de l'Université Paris-Saclay (CCUPS)*, College B, Section 27, since december 2021.
- Co-organizer of the LSV seminar at ENS Cachan 2012-2018.
- Co-organizer of the workshop GAMES 2011 - Games for Design and Verification. Paris, August 31st - September 3rd, 2011. 75 participants.
- Seminar "The magic of Automata", for visiting Romanian students at ENS Cachan. June 23rd, 2011.
- Co-organizer of the special seminar PaVas - Pushdown Automata and Vector Addition Systems. Cachan, January 20th, 2011. 90 participants.
- Selection committee member for a "Maître de Conférences" (assistant professor) position at Université Paris 7. November-December 2010.
- Seminar "The Magic of Automata", at the open-day of ENS Cachan for newly admitted students. September 9th, 2010.
- Member of the local organizing committee of MOVEP, a 5-days summer school on Modelling and Verifying Parallel Processes. Brussels, Belgium, December 2004.
- Co-organizer of the weekly lab seminar at EPFL 2007-2008.

# References

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Other references available upon request.