

Damien Regnault (Extended CV)

Maître de conférences (Assistant Professor)

Address: IBISC, Université d'Évry-Val-d'Essonne (UEVE)
Institut de Biologie Génétique et Bio-Informatique (IBGBI),
23 boulevard de France, 91037 Évry cedex, France

Tel: +33 1 64 85 34 77

Email: damien.regnault@univ-evry.fr

www: <https://www.ibisc.univ-evry.fr/~dregnault/>

Spoken languages: French, English.

Academic history:

2023: Preparation of a HDR at IBISC, université Paris-Saclay.

Defended november 8th 2023 at Ibisc.

*Formation de pavages par
auto-assemblage et auto-stabilisation.*

Referees: Emmanuel Jeandel, Jarkko Kari, Matthew J. Patitz

Jury : Valérie Berthé, Johanne Cohen, Pierre Fraigniaud

2005-2008: Preparation of a doctoral thesis at LIP, ENS Lyon.

Defended november 24th 2008 at École Normale Supérieure de Lyon.

*Sur les automates cellulaires probabilistes:
comportements asynchrones.*

PhD advisors: Nicolas Schabanel, Éric Thierry.

Referees: Alexander Shen, Bernard Ycart, Cristopher Moore

Jury : Jean Mairesse, Alexander Shen, Bernard Ycart, Pascal Koiran

2005: Master's degree in Computer Science, ENS Lyon.

2002-2006: *Élève Normalien*, École Normale Supérieure (ENS) de Lyon.

Employment record:

2010- *Maître de conférences* (Assistant Professor), IBISC, Université d'Évry Val-d'Essonne (UEVE).

2009-2010 *ATER*, LIF, Université de Provence.

2006-2009 *PhD Student*, LIP, École Normale Supérieure de Lyon.

Teaching

I started teaching as a moniteur at ENS Lyon from 2006 to 2009 doing 64 hours of tutorials per year. Then, I worked one year as ATER at université de Provence Aix-Marseille 1. From 2010, I am an assistant professeur (maître de conférence) at the computer science department of UEVE with an obligation of 192 hours of tutorials per year (one hour of lecture is counted as 1.5 hour of tutorial). On average, I have done 250 hours of tutorials per year (120% of my obligation).

Most of my teaching (112 hours per year) focuses on algorithmic: introduction to computer science (L1), introduction to algorithmics (L2), calculability and complexity (L3) and approximation algorithms (M2). These lectures are theoretical and focus on developing algorithms, proving their correctness and analyzing their complexity. Generally, there are two hundred students in L1 and around fifteen students in M2. Most of them come from the computer science department but some are from the department of mathematics, biology or law. Grabbing the attention of all these students requires to choose adequate examples. Otherwise, I am frequently doing tutorials and sometimes lectures on applied topics (networks, programming, database) when my help is required. Along the years, I have been involved in most teaching done during the three years of a licence's (bachelor's) degree.

In 2022, I have created with Sergiu Ivanov a new M2 lecture about self-assembly. It is addressed to students proficient in both computer science and biology. It relies on the software ENSnano developed by Nicolas Levy and Nicolas Schabanel.

Scientific popularization (“fête des sciences”)

2014 – 2016 Creation of the stand “Tilings” (UEVE).

2013 – 2014 Exhibitor at the stand “Turing Machine” (UEVE).

Collective responsibility

Sept 2024 –	Director (computer science department, UEVE).
Oct 2023 – Sept 2024	Assistant director (computer science, UEVE).
Sept 2022 –	In charge of M1 MIAGE apprentissage (UEVE).
Mars 2019 – Mars 2021	Substitute member of IBISC’s council laboratory.
Sept 2014 – Sept 2018	Co-organizer of IBISC Seminar.
Sept 2012 – Sept 2019	In charge of L2 (UEVE).
Sept 2010 – Sept. 2011	In charge of L3 ASR (UEVE).
Nov. 2008 – Sept 2009	Co-organizer of MC2 team meeting.

Communications

I regularly review articles for international conferences (MFCS 2009, STACS 2009, ACRI 2012 and 2014, WAOA 2012, STACS 2019, SODA 2021 and 2023) and international journals (journal of cellular automata, NACO, TCS, TSI, Physica D: Nonlinear Phenomena, ACA, Neural Networks, Biosystems). I have presented my scientific results in approximately forty team or laboratory seminars and talks in conferences and workshops. In particular, I have been invited to the workshop PCA EURANDOM at Eindhoven (Netherlands) in January 2013, the workshop “Discrete Models of Complex Systems” at Orléans organized by *le Stadium* in March 2018, the conference in honor of the 60 years of Éric Rémy at ENS-Lyon in May 2019 and the “Journées SDA2 2024”.

Supervision (internship)

- 2020-2021 L. Venturini (Internship during 4th year of ENS-Lyon)
Poursuite des travaux démarrés durant le stage de M2.
Founding by FRR action 2
- 2020 M2 - L. Venturini (ENS-Lyon).
Analyse du comportement asynchrone de l'automate cellulaire TOTM34.
Founding by IBISC.
- 2014 L3 - M. Hassani (UEVE).
Recherche des configurations stables de l'automate cellulaire OTM 38.
- 2013 L3 - J. Sobieraj (UEVE).
Isomorphismes et intersections de cycles dans les réseaux d'automates booléens asynchrones. Published in UCNC 2015.
Done with Tarek Melliti and Sylvain Sené.
- 2012 L3 - V. Verhille (ENSIIE).
Importance de la dynamique synchrone dans l'étude des réseaux d'automates booléens non monotones.
Done with Sylvain Sené.
- 2011 L3 - F. Rabin (ENSIIE).
Étude des circuits k-xor circulants.
Done with Sylvain Sené.

Supervision (thesis)

2013-2016: Preparation of a doctoral thesis by S. Morais at IBISC, UEVE.

Defended november 23th 2016 at Université Paris-Saclay.

Étude et obtention d'heuristiques et d'algorithmes exacts et approchés pour un problème de partitionnement de maillage sous contrainte mémoire.

PhD advisors: É. Angel (50%), F. Ledoux (25%), D. Regnault (25%).

Referees: C. Durr, F. Pellegrini.

Jury : C. Bazgan, I. Todinca, J.-C. Janodet.

Published Articles: International conference EuroPAR [4],

National conferences COMPAS [1] et ROADEF [2].

Sébastien Morais was recruited by the CEA as an ingénieur-chercheur.

He is also working as a PAST in the computer science department of UEVE.

2022- : Preparation of a doctoral thesis by X. Zhang at IBISC, UEVE.

Optimisation multicritère et stochastique pour l'ordonnancement
PhD advisors: É. Angel (50%), F. Chu (25%), D. Regnault (25%).

Articles published in international peer-reviewed journal.

- [1] Xiechen Zhang, Éric Angel, Feng Chu, Damien Regnault. Minimizing total completion time and makespan for a multi-scenario bi-criteria parallel machine scheduling problem. *European Journal of Operational Research (EJOR)*, volume 321(2): pages 397-406, 2025.
- [2] Damien Regnault and Éric Rémila. Lost in self-stabilization: A local process that aligns connected cells. *Theoretical Computer Science (TCS)*, volume 736: pages 41-61, 2018.
- [3] Éric Angel, Kim Thang Nguyen and Damien Regnault. Improved local search for universal facility location. *Journal of combinatorial Optimization*, volume 29: pages 237-246, 2015.
- [4] Mathilde Noual, Damien Regnault, and Sylvain Sené. About non-monotony in Boolean automata networks. *Theoretical Computer Science (TCS)*, volume 504: pages 12-25, 2013.
- [5] Damien Regnault, Jean-Baptiste Rouquier, and Éric Thierry. Stochastic minority on graphs. In *Theoretical Computer Science (TCS)*, special issue on computation theory of cellular automata and discrete dynamical systems, volume 412, issue 30: pages 3947-3963, 2011.
- [6] Damien Regnault, Nicolas Schabanel, and Éric Thierry. On the analysis of “simple” 2D cellular automata. In *Discrete Mathematics and Theoretical Computer Science (DMTCS)*, special issue, volume 12, number 2, online publication, 2010.

- [7] Damien Regnault, Nicolas Schabanel, and Éric Thierry. Progresses in the analysis of stochastic 2D cellular automata: A study of asynchronous 2D minority. *Theoretical Computer Science (TCS)*, volume 410(47-49): pages 4844–4855, 2009.

Articles published in national peer-reviewed journal.

- [1] Tarek Melliti, Mathilde Noual, Damien Regnault, Adrien Richard, and Sylvain Sené. Cycles, double-cycles d'interactions et modes de mise à jour. *Technique et Science Informatiques (TSI)*, volume 34(4), pages 401-430, 2015.

Articles published in international peer-reviewed conferences or workshops.

- [1] C. Bertrand, C. Di Giusto, H. Klaudel and D. Regnault. Complexity of Membership and Non-Emptiness Problems in Unbounded Memory Automata. *Proceedings of CONCUR 2023*, LIPIcs 279, pages 33:1-33:17.
- [2] Jacques Demongeot, Tarek Melliti, Mathilde Noual, Damien Regnault and Sylvain Sené. On Boolean Automata Isolated Cycles and Tangential Double-Cycles Dynamics. In *Automata and Complexity*, Springer, ECC 42, page 145–178, 2022.
- [3] Éric Angel, Sébastien Morais and Damien Regnault. A Bi-Criteria FP-TAS for Scheduling with Memory Constraint on Graphs with Bounded Tree-width. In *Euro-Par: Proceedings of the 28th International Conference on Parallel and Distributed Computing*, LNCS 13440, pages 136-151, 2022.
- [4] Pierre-Étienne Meunier and Damien Regnault. Directed non-cooperative tile assembly is decidable. In *DNA: Proceedings of the 27th International Conference on DNA Computing and Molecular Programming*, LIPIcs 205, pages 6:1–6:21, 2021.
- [5] Pierre-Étienne Meunier, Damien Regnault and Damien Woods. The program-size complexity of self-assembled paths. In *STOC: Proceedings of the 52nd Annual ACM SIGACT Symposium on Theory of Computing*, pages 727-737, 2020.

- [6] Pierre-Étienne Meunier and Damien Regnault. Non-cooperatively Assembling Large Structures. In *DNA: Proceedings of the 25th International Conference on DNA Computing and Molecular Programming*, LNCS 11648, pages 120-139, 2019.
- [7] Tarek Melliti, Damien Regnault, Adrien Richard and Sylvain Sené. Asynchronous Simulation of Boolean Networks by Monotone Boolean Networks. In *ACRI: Proceedings of the 12th International Conference on Cellular Automata for Research and Industry*, LNCS 9863, page 182-191, 2016.
- [8] Éric Angel, Cédric Chevalier, Franck Ledoux, Sébastien Morais and Damien Regnault. FPT Approximation Algorithm for Scheduling with Memory Constraints. In *Euro-Par: Proceedings of the 22nd International Conference on Parallel and Distributed Computing*, LNCS 9833, pages 196-208, 2016.
- [9] Damien Regnault and Éric Rémila. Lost in Self-Stabilization. In *MFCS: Proceedings of the 40th International Symposium on Mathematical Foundations of Computer Science*, LNCS 9234, page 432-443, 2015.
- [10] Tarek Melliti, Mathilde Noual, Damien Regnault, Sylvain Sené and Jérémy Sobieraj. Asynchronous Dynamics of Boolean Automata Double-Cycles. In *UCNC: Proceedings of the 14th International Conference on Unconventional Computing and Natural Computing*, LNCS 9252, page 250-262, 2015.
- [11] Tarek Melliti, Damien Regnault, Adrien Richard and Sylvain Sené. On the convergence of boolean automata networks without negative cycles. In *AUTOMATA: Proceedings of the 19th International Workshop on Cellular Automata and Discrete Complex Systems*, LNCS 8155, page 124-138, 2013.
- [12] Éric Angel, Kim Thang Nguyen and Damien Regnault. Improved local search for universal facility location. In *COCOON: Proceedings of the 19th International Conference on Computing and Combinatorics*, LNCS 7936, page 316-324, 2013.
- [13] Damien Regnault. Proving a phase transition in cellular automata under asynchronous dynamics. In *DLT: Proceedings of 17th International*

Conference on Developments in Language Theory, LNCS 7907, page 433-444, 2013.

- [14] Mathilde Noual, Damien Regnault and Sylvain Sené. Boolean networks synchronism sensitivity and XOR circulant networks convergence time. In *AUTOMATA & JAC: Proceedings of 18th international workshop on Cellular Automata and Discrete Complex Systems and 3rd international symposium Journées Automates Cellulaires*, EPTCS 90, page 37-52, Open Publishing Association, 2012.
- [15] Thomas Fernique and Damien Regnault. Stochastic flips on dimer Tilings. In *AofA: Proceedings of the 21st International Meeting on Probabilistic, Combinatorial, and Asymptotic Methods in the Analysis of Algorithms*, DMTCS proceedings, volume (AM), page 207-220, on-line publication, 2010.
- [16] Olivier Bodini, Thomas Fernique and Damien Regnault. Stochastic flips on two-letter words. In *ANALCO: Proceedings of the 7th Workshop on Analytic Algorithmics and Combinatorics*, page 48-55, SIAM, 2010.
- [17] Olivier Bodini, Thomas Fernique and Damien Regnault. Cristallization by stochastic flips. In *Proceedings of Aperiodics 2009, Journal of Physics: Conference Series*, volume 226(012022):131-136, 2010.
- [18] Damien Regnault. Quick energy drop in stochastic 2D Minority. In *ACRI: Proceedings of the 8th International Conference on Cellular Automata for Research and Industry*, volume 5191 of *LNCS*, pages 307–314. Springer, 2008.
- [19] Damien Regnault. Directed percolation arising in stochastic cellular automata. In *MFCS: Proceedings of the 33rd International Symposium on Mathematical Foundations of Computer Science*, volume 5162 of *LNCS*, pages 563–574. Springer, 2008.
- [20] Damien Regnault, Nicolas Schabanel, and Éric Thierry. On the analysis of “simple” 2D cellular automata. In *LATA: Proceedings of the 2nd International Conference on Language and Automata Theory and Applications*, volume 5196 of *LNCS*, pages 463–474, Springer 2008.
- [21] Damien Regnault, Nicolas Schabanel, and Éric Thierry. Progresses in the analysis of stochastic 2D cellular automata: a study of asynchronous 2D

- Minority. In *MFCS: Proceedings of the 32nd International Symposium on Mathematical Foundations of Computer Science*, volume 4708 of *LNCS*, pages 320–332. Springer, 2007.
- [22] Damien Regnault. Abrupt behaviour changes in cellular automata under asynchronous dynamics. In *ECCS: Proceedings of European Conference on Complex Systems*, 6 pages, 2006.
- [23] Nazim Fatès, Damien Regnault, Nicolas Schabanel, and Éric Thierry. Asynchronous behaviour of double-quiescent elementary cellular automata. In *LATIN: Proceedings of the 7th Latin American Symposium*, volume 3887 of *LNCS*, pages 455–466. Springer, 2006.

Articles published in national peer-reviewed conferences or workshops.

- [1] Éric Angel, Cédric Chevalier, Franck Ledoux, Sébastien Morais, and Damien Regnault. Partitionnement de maillages sous contrainte mémoire à l'aide de la programmation linéaire en nombres entiers. In *Conférence d'informatique en Parallélisme, Architecture et Système (COMPAS) 2016*.
- [2] Éric Angel, Cédric Chevalier, Franck Ledoux, Sébastien Morais, Kim Thang Nguyen, and Damien Regnault. Algorithme approché pour un problème de partitionnement de maillage sous contrainte mémoire. In *Conférence d'informatique en Recherche Opérationnelle et Aide à Décision En France (ROADEF) 2014*.