

FRÉDÉRIQUE BASSINO's Curriculum vitae

Full Professor in Computer Science at University Sorbonne Paris Nord <http://lipn.fr/~bassino>
Laboratoire d'Informatique de Paris Nord (LIPN) UMR 7030

EDUCATIONAL BACKGROUND

- 2005 Habilitation in computer science, Univ. of Marne-la-Vallée.
 - 1996 PhD in fundamental computer science, at Univ. of Marne-la-Vallée.
 - 1993 Agrégation in mathematics (highest teaching degree).
Former student of Ecole Normale Supérieure - ENS Cachan.
-

PROFESSIONAL EXPERIENCE

- 2008-.... Full Professor in Computer Science at Univ. Sorbonne Paris Nord
 - 1998-2008 Assistant Professor in Computer Science at Univ. of Marne-la-Vallée.
 - 1997-1998 ATER in Computer Science at Univ. of Marne-la-Vallée.
 - 1994-1997 Research and teaching associate in Computer Science at Univ. of Marne-la-Vallée.
-

RESEARCH INTERESTS : COMBINATORICS AND ALGORITHMS

My research lies at the crossroads of combinatorics, algorithms and theoretical computer science. The guiding principle is the study of the quantitative properties of discrete combinatorial structures, which are ubiquitous in computer science. I'm particularly interested in words and automata, as well as permutations and graphs. My aim is to quantify "metric", or algebraic, properties of these objects, based on fine-grained combinatorial analysis. This analysis is a key step towards simulating these structures, studying their limit forms or precisely analyzing the behavior of algorithms that manipulate them. The methods I use are bijective, probabilistic or derived from analytic combinatorics.

NATIONAL AND INTERNATIONAL ADMINISTRATIVE RESPONSIBILITIES

- 2024-2029* Member of the scientific council of the Centre International de Recherches Mathématique (CIRM).
- 2023-2025* Member of the scientific evaluation committee CE 48 : Digital foundations of the ANR.
- 2019-2022* Member of the Computer Sciences Evaluation Group (GE1507) for the Discovery Grants Program of the CRSNG/NSERC (Canada).
- 2015-2018* Member of the jury of the Institut Universitaire de France Membre (IUF).
- 2012-2016* President of the 6th section (Computer Science) of the National Committee for Scientific Research (CoNRS). The CoNRS is in charge of the recruitments and the careers of CNRS researchers ; of the evaluation of the CNRS labs and international structures.
- 2012-2016* Member of the board of the Conference of Presidents of the National Committee for Scientific Research (CoNRS).
- 2014-2016* Coordinator of the CoNRS Executive Committee.
- 2010-2011* Member (as full professor) of the French National Board of Universities (CNU - 27th section - Computer Science)
- 2001-2008* Member (as assistant professor) of the French National Board of Universities (CNU - 27th section - Computer Science)

SCIENTIFIC ANIMATION

- 2025-2029 Head of the MathSTIC Federation, which brings together 3 laboratories - LAGA (Mathematics), LIPN (Computer Science) and L2TI (Information Processing) - at University Sorbonne Paris North (300 researchers).
- 2024-... Member of the Executive and Steering Committees of the national research network in Fundamental Computing and its Mathematics (Gdr IFM).
- 2018-2024 Head of the Computer Science Lab (Laboratoire d'informarique de Paris Nord) - CNRS & University Sorbonne Paris North (150 members).
- 2015-2019 Co-head of the International Research Group (CNRS GdRI) AleaNetwork (9 european universities).
- 2012-2018 Co-head of the Working Group ALEA (190 researchers) in the CNRS Research Group (GdR) Mathematical Computer Science.
- 2010-2018 Head of the CALIN team (Combinatorics, Algorithms and Interactions) since its creation - 26 researchers.
- 2010-2015 Local coordinator of the ANR Blanc project MAGNUM - 560 000 Euros.
- 2007-2010 Principal Investigator of the ANR Blanc project GAMMA - 230 000 Euros.
- 2010- ... Organizer of the Seminar on Analytic and Enumerative Combinatorics of the Institut Henri Poincaré (IHP).

EDITORIAL AND PROGRAM COMMITTEES

- Since 2021, Editor in chief of *Annals of Combinatorics*
- Since 2024, Editor of *La Matematica*
- Since 2021, Member of the steering committee of the Analysis of Algorithms(AofA) annual conference. Since 2024, Head of this steering committee.
- In 2026, Coordinator of the **CIMPA School Topological and Extremal Properties of Combinatorial Structures**, 6-18 July 2026, University of Abomey Calavi, Benin.
- In 2025, Coordinator of the **CIMPA School Enumerative combinatorics with applications to computer science**, 6-17 January 2025, Stellenbosch University, South Africa.
- Organizer of the international conferences PP 2012, LAGOS 2017, AofA'19.
- Member of the CPs of the conferences ANALCO 2018, LATIN 2020, GASCom 2022, CPM 2022, LATIN 2022, GASCom 2024, AofA 2024, CIAA 2025, LAGOS 2025.

PUBLICATIONS

I have published a book and **60 articles or communications** in international journals or conferences. I was also editor of the proceedings of 3 international conférences.

BOOK

- [1] F. Bassino, I. Kapovich, M. Lohrey, A. Myasnikov, C. Nicaud, A. Nikolaev, I. Rivin, V. Shpilrain, A. Ushakov, P. Weil. *Complexity and Randomness in Group Theory*. 374+xii pages. De Gruyter. June 2020.

INTERNATIONAL JOURNALS

- [2] F. Bassino, C. Nicaud, P. Weil, Silhouettes and generic properties of subgroups of the modular group. *Groups, Geometry, and Dynamics*. 31 pages. Preprint arXiv :2311.08021. To appear.

- [3] F. Bassino, C. Nicaud, P. Weil, Random generation of subgroups of the modular group with a fixed isomorphism type. *The Electronic Journal of Combinatorics*, vol. 31(4), P4.7, 27 pages, 2024.
- [4] F. Bassino, M. Bouvel, M. Drmota, V. Féray, L. Gerin, M. Maazoun, A. Pierrot, Linear-sized independent sets in random cographs and increasing subsequences in separable permutations. *Combinatorial Theory*. vol. 2, No. 3, 35 pages, 2022.
- [5] F. Bassino, M. Bouvel, V. Féray, L. Gerin, M. Maazoun, A. Pierrot, Scaling limits of permutation classes with a finite specification : a dichotomy. *Advances in Mathematics*. vol. 405, Article 108513, 84 pages, 2022.
- [6] F. Bassino, M. Bouvel, V. Féray, L. Gerin, M. Maazoun, A. Pierrot, Random cographs : Brownian graphon limit and asymptotic degree distribution. *Random Structures and Algorithms*. vol. 60, No. 2, 166-200, 2022.
- [7] F. Bassino, C. Nicaud, P. Weil, Statistics of subgroups of the modular group. *International Journal of Algebra and Computation*, vol. 31, No. 8, 1691-1751, 2021.
- [8] F. Bassino, C. Nicaud, P. Weil, Random presentations and random subgroups : a survey. *Complexity and Randomness in Group Theory*. De Gruyter. p. 45–75, 2020.
- [9] F. Bassino, M. Bouvel, V. Féray, L. Gerin, M. Maazoun, A. Pierrot. Universal limits of substitution-closed permutation classes. *Journal of the European Mathematical Society*. vol. 22, No. 11, 3565-3639, 2020.
- [10] F. Bassino, M. Bouvel, V. Féray, L. Gerin, A. Pierrot. The Brownian limit of separable permutations. *Annals of Probability*, vol. 46, No. 4, 2134-2189, 2018.
- [11] F. Bassino, M. Bouvel, A. Pierrot, C. Pivoteau, D. Rossin. An algorithm for computing combinatorial specifications of permutation classes. *Discrete Applied Mathematics*, vol. 224, p. 16–44, 2017.
- [12] F. Bassino, C. Nicaud, P. Weil, Genericity properties of free groups and finite presentations. *Contemporary Mathematics*, vol. 677 - Algebra and Computer Science - p. 1–44, 2016.
- [13] F. Bassino, C. Nicaud, P. Weil, On the genericity of Whitehead minimality, *Journal of Group Theory*, vol. 19. p. 137–159, 2016.
- [14] F. Bassino, M. Bouvel, A. Pierrot, D. Rossin, An algorithm for deciding the finiteness of the number of simple permutations in permutation classes, *Advances in Applied Mathematics*, vol. 64. p. 124–200. 2015.
- [15] F. Bassino, J. Clément, G. Seroussi, A. Viola, Optimal prefix codes for pairs of geometrically-distributed random variables, *IEEE Transactions on Information Theory*, vol. 59 (4). p. 2375-2395, 2013.
- [16] F. Bassino, A. Martino, C. Nicaud, E. Ventura, and P. Weil, Statistical properties of subgroups of free groups, *Random Structures & Algorithms*, vol. 42 (3). p. 349–373, 2013.
- [17] F. Bassino, J. Clément, P. Nicodème, Counting occurrences for a finite set of words : combinatorial methods, *ACM Transactions on Algorithms*, vol. 8 (3), Article 31, 28 pages, 2012.
- [18] F. Bassino, J. David, C. Nicaud, Average Case Analysis of Moore’s State Minimization Algorithm. *Algorithmica*, vol. 63 (1-2), p. 509–531. 2012.
- [19] F. Bassino, M. Bouvel, D. Rossin, Enumeration of pin-permutations, *The Electronic Journal of Combinatorics*, vol. 18 (1), *P57. 39 pages, 2011.
- [20] F. Bassino, M. Bouvel, A. Pierrot, D. Rossin, Deciding the finiteness of the number of simple permutations contained in a wreath-closed class is polynomial, *Pure Mathematics and Applications*, vol. 21 (2), p. 119-135, 2010.
- [21] F. Bassino, L. Giambruno, C. Nicaud, The average state complexity of rational operations on finite languages. *International Journal of Foundations of Computer Science*, vol. 21 (4), p. 495-516, 2010.

- [22] F. Bassino, J. David, C. Nicaud, Enumeration and random generation of possibly incomplete deterministic automata, *Pure Mathematics and Applications*, 19 (2-3), p. 1-16, 2008.
- [23] F. Bassino, C. Nicaud, P. Weil, Random generation of finitely generated subgroups of a free group, *International Journal of Algebra and Computation*, 18 (2), p. 375-405, 2008.
- [24] F. Bassino, C. Nicaud, Enumeration and random generation of accessible automata, *Theoretical Computer Science*, 381, p. 86-104, 2007.
- [25] S. Akiyama, F. Bassino, C. Frougny, Arithmetic Meyer sets and finite automata, *Information and Computation*, 201, p. 199-215, 2005.
- [26] F. Bassino, J. Clément, C. Nicaud, The Standard Factorization of Lyndon Words : an Average Point of View, *Discrete Mathematics*, 290, p. 1-25, 2005.
- [27] F. Bassino, H. Prodinger, (q, δ) -numeration systems with missing digits, *Monatshefte fuer Mathematik*, 141, p. 89-99, 2004.
- [28] F. Bassino, M.-P. Béal, D. Perrin, A finite state version of the Kraft McMillan theorem, *SIAM Journal in Computing*, 30 :4, p. 1211-1230, 2000.
- [29] F. Bassino, Generating functions of circular codes, *Advances in Applied Mathematics*, 22, p. 1-24, 1999.
- [30] F. Bassino, M.-P. Béal, D. Perrin, Enumerative sequences of leaves and nodes in rational trees, *Theoretical Computer Science*, 221, p. 41-60, 1999.
- [31] F. Bassino, Nonnegative companion matrices and star-height of $\mathbb{N}$ -rational series, *Theoretical Computer Science*, 180, p. 61-80, 1997.

INTERNATIONAL CONFERENCES

- [32] F. Bassino, T. Rakotoarimalala, A. Sportiello, The complexity of Approximate Multiple Pattern Matching Problem for random strings. In *31st International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2020)*, volume 159 Paper #3 in Leibniz International Proceedings in Informatics (LIPIcs), 12 pages, Klagenfurt, Austria, June 2020.
- [33] F. Bassino, A. Sportiello, Linear-time exact sampling of sum-constrained random variables. In *11th International Conference on Random and Exhaustive Generation of Combinatorial Structures (GASCom 2018)*, CEUR Workshop Proceedings volume 2113 p. 94-105. Athens, Greece, June 2018.
- [34] F. Bassino, T. Rakotoarimalala, A. Sportiello, The complexity of Multiple Pattern Matching Problem for random strings. In *Meeting on Analytic Algorithmics and Combinatorics (ANALCO'18)*, New Orleans, Louisiana, pp. 40-53. January 2018.
- [35] F. Bassino, A. Sportiello, Linear-time generation of inhomogenous random directed walks, In *Meeting on Analytic Algorithmics and Combinatorics (ANALCO'15)*, San Diego, California, p. 51-65. January 2015.
epubs.siam.org/doi/book/10.1137/1.9781611973761.
- [36] O. Ait Mous, F. Bassino, C. Nicaud. An efficient linear pseudo-minimization algorithm for Aho-Corasick automata. In *23rd Annual Symposium on Combinatorial Pattern Matching (CPM 2012)*, volume 7354 in Lect. Notes Comput. Sci., p. 110-123, 2012.
- [37] F. Bassino, M. Bouvel, A. Pierrot, D. Rossin, Combinatorial specification of permutation classes, *24th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'12)*, Discrete Mathematics and Theoretical Computer Science Proceedings. vol. 126. p. 781-792, 2012.
- [38] F. Bassino, C. Nicaud, P. Weil. Generic properties of random subgroups of a free group for general distributions. In *23rd International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2012)*, Montréal, Canada. Discrete Mathematics and Theoretical Computer Science Proceedings. p. 155-166, 2012.

- [39] F. Bassino, J. David, A. Sportiello, Asymptotic enumeration of minimal automata, In *29th International Symposium on Theoretical Aspects of Computer Science (STACS 2012)*, volume 14 in Leibniz International Proceedings in Informatics (LIPIcs), p. 88-99, 2012, www.stacs-conf.org,
- [40] O. Ait Mous, F. Bassino, C. Nicaud. Building the Minimal Automaton of A^*X in Linear Time, When X Is of Bounded Cardinality. In *21st Annual Symposium on Combinatorial Pattern Matching (CPM 2010)*. volume 6129. in Lect. Notes Comput. Sci., p. 275–287. Springer-Verlag, 2010.
- [41] F. Bassino, L. Giambruno, C. Nicaud. Complexity of operations on cofinite languages. In *9th Latin American Theoretical Informatics Symposium (LATIN 2010)*. volume 6034 in Lect. Notes Comput. Sci., p. 222–233. Springer-Verlag, 2010 .
- [42] F. Bassino, A. Martino, C. Nicaud, E. Ventura, P. Weil. On two distributions of subgroups of free groups. In the *SIAM Workshop on Analytic Algorithmics and Combinatorics (ANALCO'10)*. Austin, Texas. January 2010. p. 82–89. www.siam.org/proceedings/analco2010, 2010.
- [43] F. Bassino, M. Bouvel, A. Pierrot, D. Rossin. Deciding the finiteness of simple permutations contained in a wreath-closed class is polynomial. In *Permutation Patterns 2009 (PP 2009)*. p. 13-20, 2009.
- [44] F. Bassino, J. David, C. Nicaud. On the average complexity of Moore's state minimization algorithm. In *26th International Symposium on Theoretical Aspects of Computer Science (STACS 2009)*. p. 123-134. www.stacs-conf.org, 2009.
- [45] F. Bassino, J. Clément, J. Fayolle, P. Nicodème, Constructions for clumps statistics, *5th International Colloquium on Mathematics and Computer Science (MathInfo'08)*, Discrete Mathematics and Theoretical Computer Science Proceedings. vol. AG. p. 183-198, 2008.
- [46] F. Bassino, J. David, C. Nicaud, Random generation of possibly incomplete deterministic automata, in *Génération Aléatoire de Structures COMbinatoires (Gascom'08)*, p. 31- 40, 2008.
- [47] F. Bassino, L. Giambruno, C. Nicaud, The average state complexity of the star of a finite set of words is linear, *International Conference on Developments in Language Theory 2008 (DLT'08)* volume 5257 in Lect. Notes Comput. Sci., p. 134-145. Springer, 2008.
- [48] F. Bassino, J. Clément, J. Fayolle, P. Nicodème, Counting occurrences for a finite set of words : an inclusion-exclusion approach, *Analysis of Algorithms (AofA 07)*, Discrete Mathematics and Theoretical Computer Science, vol. AH, p. 29-44, 2007.
- [49] F. Bassino, J. David, C. Nicaud, REGAL : a Library to randomly and exhaustively generate automata, in Jan Holub, Jan Zdarek, editors, *12th International Conference on Implementation and Application of Automata (CIAA'07)*, volume 4783 in Lect. Notes Comput. Sci., p. 303-305 (poster), Springer, 2007. (poster)
- [50] F. Bassino, J. Clément, G. Seroussi, A. Viola, Optimal prefix codes for families of two-dimensional geometric distributions, *Data Compression Conference 2006 (DCC'06)* , IEEE Computer Society Press, p. 113-122, 2006.
- [51] F. Bassino, J. Clément, G. Seroussi, A. Viola, Optimal prefix codes for pairs of geometrically-distributed random variables, *IEEE International Symposium on Information Theory (ISIT'06)*, 5 pages, 2006.
- [52] F. Bassino, C. Nicaud. Accessible and Deterministic Automata : Enumeration and Boltzmann Samplers. *International Colloquium on Mathematics and Computer Science 2006*, Discrete Mathematics and Theoretical Computer Science, vol. AG, p. 151-160, 2006.
- [53] S. Akiyama, F. Bassino, C. Frougny, Automata for arithmetic Meyer sets, *Latin American Theoretical Informatics 2004 (LATIN'04)*, volume 2976 in Lect. Notes Comput. Sci., p. 252-261. Springer, 2004.

- [54] F. Bassino, J. Clément, C. Nicaud, Lyndon words with a fixed standard right factor, *the ACM-SIAM Annual Symposium on Discrete Algorithms 2004 (SODA'04)*, p. 646-647, ACM-SIAM, 2004. (article court)
- [55] F. Bassino, J. Clément, C. Nicaud, The average lengths of the factors of the standard factorization of Lyndon words, *International Conference on Developments in Language Theory 2002 (DLT'02)*, M. Ito and M. Toyama, Eds., volume 2450 in Lect. Notes Comput. Sci., p. 307-318, Springer, 2003.
- [56] F. Bassino, Beta-expansions for cubic Pisot numbers, *Latin American Theoretical INformatics 2002 (LATIN'02)*, S. Rajsbaum, Ed., volume 2286 in Lect. Notes Comput. Sci., p. 141-152. Springer, 2002.
- [57] F. Bassino, M.-P. Béal, D. Perrin, Length distributions and regular sequences, *Codes, Systems and Graphical Models*, J. Rosenthal and B. Marcus, Eds., Volume 123 in the series IMA Volumes in Mathematics and its Applications, Springer-Verlag, p. 415-438, 2001.
- [58] F. Bassino, M.-P. Béal, D. Perrin, Super-state automata and rational trees, *Latin American Theoretical INformatics (LATIN 98)*, C. L. Lucchesi and A. V. Moura, Eds., volume 1380 in Lect. Notes Comput. Sci., p. 42-52. Springer, 1998.
- [59] F. Bassino, Distributions de longueurs des codes circulaires, *9-th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 97)*, P. Paule and V. Strehl, Eds., p. 61-72. 1997.
- [60] F. Bassino, M.-P. Béal, D. Perrin, Enumerative sequences of leaves in rational trees, *International Colloquium on Automata, Languages and Programming 1997 (ICALP 97)*, P. Degano, R. Gorrieri and A. Marchetti-Spaccamela, Eds., volume 1256 in Lect. Notes Comput. Sci., p. 76-86. Springer, 1997.
- [61] F. Bassino, Star-height of an $\mathbb{N}$ -rational series, *International Symposium on Theoretical Aspects of Computer Science 1996 (STACS 96)*, C. Puech and R. Reischuk, Eds., volume 1046 in Lect. Notes Comput. Sci., p. 125-135. Springer, 1996.

EDITION

- [62] *Selected papers from LAGOS 2017 : IX Latin-American Algorithms, Graphs, and Optimization Symposium*, edited by F. Bassino, F. Bonomo, L. Pournin, M. Valencia-Pabon. *Discrete Applied Mathematics*. vol. 281. 2020.
- [63] *Proceedings of LAGOS 2017 : IX Latin-American Algorithms, Graphs, and Optimization Symposium*, edited by F. Bassino, F. Bonomo, L. Pournin, M. Valencia-Pabon, J. Vera. *Electronic Notes in Discrete Mathematics*. vol. 62. 2017.
- [64] *Selected papers from the 11th Permutation Patterns Conference (PP 2013)*, edited by F. Bassino, M. Bouvel, D. Rossin. *Journal of Combinatorics*. vol. 6 (1-2). 2015.
- [65] *Proceedings of the 8th Journées Montoises d'Informatique Théorique*, édités par F. Bassino et V. Bruyère, *Bulletin of the Belg. Math. Soc.* 2, 8, 2001.

PREPRINTS

- [66] F. Bassino, M. Bouvel, V. Féray, L. Gerin, A. Pierrot, Scaling limit of graph classes through split decomposition. 47 pages. July 2022. Preprint arXiv :2207.12253. Submitted.
- [67] F. Bassino, M. Bouvel, V. Féray, L. Gerin, A. Pierrot, Dense and nondense limits for uniform random intersection graphs. 45 pages. March 2024. Preprint arXiv :2402.06394. Submitted.