# 1. Produits et activités de la recherche de l'équipe LIMD

## 1.1 Production de connaissances et activités concourant au rayonnement et à l'attractivité scientifique de l'équipe LIMD

*1.1.1. Journaux, revues*

### Articles publiés dans des revues à comité de lecture - Équipe LIMD


[1] Mounia Achoch, Rodrigo Dorantes-Gilardi, Chris Wymant, Giovanni Feverati, Kave Salamatian, Laurent Vuillon et Claire Lesieur : Protein structural robustness to mutations : an in silico investigation. *Phys. Chem. Chem. Phys.*, 18:13770–13780, 2016.

[2] Alexandre Aksenov : Counting solutions without zeros or repetitions of a linear congruence and rarefaction in b-multiplicative sequences. *J. Théo. Nombres Bordeaux*, 27:625–654, 2015.

[3] Peter Bettyani et Karim Nour : Strong normalization of lambda-sym-prop and lambda bare-mu-mu tilde*-calculi. *Logical Methods in Computer Science*, 13:1–22, 2017.

[4] Peter Bettyani et Karim Nour : An estimation for the lengths of reduction sequences of the lambda-mu-rho-theta-calculus. *Logical Methods in Computer Science*, 14:1–35, 2018.

[5] Jean-Daniel Boissonnat, Karthik C. S. et Sébastien Tavenas : Building efficient and compact data structures for simplicial complexes. *Algorithmica*, 79(2):530–567, 2017.

[6] Nicolas Bonneel, David Coeurjolly, Pierre Gueth et Jacques-Olivier Lachaud : Mumford-shah mesh processing using the ambrosio-tortorelli functional. *Computer Graphics Forum*, 37(7):75–85, 2018.

[7] Robert Bonnet et Arkady Leiderman : Countable successor ordinals as generalized ordered topological spaces. *Topology Appl.*, 241:197–202, 2018.

[8] Elie Bretin, Roland Denis, Jacques-Olivier Lachaud et Edouard Oudet : Phase-field modelling and computing for a large number of phases. *ESAIM : Mathematical Modelling and Numerical Analysis*, 2019. Accepted, to appear (DOI https ://doi.org/10.1051/m2an/201).

[9] Thomas Caissard, David Coeurjolly, Jacques-Olivier Lachaud et Tristan Roussillon : Laplace–Beltrami operator on digital surfaces. *Journal of Mathematical Imaging and Vision*, pages 1–21, Aug 2018.

[10] Annette Casagrande et Laurent Vuillon : Sciences humaines et sociales et méthodes du numérique, un mariage heureux ? *Les Cahiers du numérique*, 13(3-4):115–136, 2017.

[11] David Coeurjolly, Marion Foare, Pierre Gueth et Jacques-Olivier Lachaud : Piecewise smooth reconstruction of normal vector field on digital data. *Comput. Graph. Forum*, 35(7):157–167, 2016. Proc. of Pacific Graphics 2016.

[12] David Coeurjolly, Bertrand Kerautret et Jacques-Olivier Lachaud : Extraction of connected region boundary in multidimensional images. *IPOL Journal*, 4:30–43, 2014.

[13] David Coeurjolly, Jacques-Olivier Lachaud et Jérémy Levallois : Multigrid convergent principal curvature estimators in digital geometry. *Computer Vision and Image Understanding*, 129:27–41, 2014. Special section : Advances in Discrete Geometry for Computer Imagery.

[14] Louis Cuel, Jacques-Olivier Lachaud, Quentin Mérigot et Boris Thibert : Robust geometry estimation using the generalized Voronoi covariance measure. *SIAM Journal on Imaging Sciences*, 8(2):1293–1314, 2015.

[15] René David et Karim Nour : About the range property for H. *Logical Methods in Computer Science*, 10:1–18, 2014.

[16] Eric Domenjoud, Xavier Provençal et Laurent Vuillon : Palindromic language of thin discrete planes. *Theoretical Computer Science*, 624:101–108, 2016. Advances in Discrete Geometry for Computer Imagery.

[17] Rodrigo Dorantes-Gilardi, Laëtitia Bourgeat, Lorenza Pacini, Laurent Vuillon et Claire Lesieur : In proteins, the structural responses of a position to mutation rely on the Goldilocks principle : not too many links, not too few. *Phys. Chem. Chem. Phys.*, 20:25399–25410, 2018.

[18] Clovis Eberhart et Tom Hirschowitz : What's in a game ? : A theory of game models. *In* Anuj Dawar et Erich Grädel, éditeurs : *Proceedings of the 33rd Symposium on Logic in Computer Science*, pages 374–383, 2018.

[19] Clovis Eberhart, Tom Hirschowitz et Thomas Seiller : An intensionally fully-abstract sheaf model for $\pi$ (expanded version). *Logical Methods in Computer Science*, Volume 13, Issue 4, novembre 2017.

[20] Giovanni Feverati, Mounia Achoch, Laurent Vuillon et Claire Lesieur : Intermolecular $\beta$-strand networks avoid hub residues and favor low interconnectedness : A potential protection mechanism against chain dissociation upon mutation. *PLOS ONE*, 9(4):1–16, 04 2014.

[21] Andrea Frosini et Laurent Vuillon : Tomographic reconstruction of 2-convex polyominoes using dual horn clauses. *Theoretical Computer Science*, 2019.

[22] Ian Gambini et Laurent Vuillon : Tiling the space by polycube analogues of Fedorov's polyhedra. *Fundamenta Informaticae*, 146:197–209, 2016.

[23] Richard Garner et Tom Hirschowitz : Shapely monads and analytic functors. *Journal of Logic and Computation*, 28(1):33–83, 2018.

[24] Aria Gheeraert, Lorenza Pacini, Victor S Batista, Laurent Vuillon, Claire Lesieur et Ivan Rivalta : Exploring allosteric pathways of a v-type enzyme with dynamical perturbation networks. *The Journal of Physical Chemistry B*, 2019.

[25] Pawel Gladki et Krzysztof Worytkiewicz : Witt rings of quadratically presentable fields. Accepted for publication in "Categories and General Algebraic Structures with Applications", 2018.

[26] Assaf Hasson et Robert Bonnet : In memoriam : Mati Rubin 1946–2017. *Bull. Symb. Log.*, 24(2):181–185, 2018.

[27] André Hirschowitz, Michel Hirschowitz et Tom Hirschowitz : Saturating directed spaces. *Journal of Homotopy and Related Structures*, 9(2):273–283, 2014.

[28] Tom Hirschowitz : Full abstraction for fair testing in CCS (expanded version). *Logical Methods in Computer Science*, 10(4), 2014.

[29] Tom Hirschowitz : Familial monads and structural operational semantics. *PACMPL*, 3(POPL): 21 :1–21 :28, 2019.

[30] Pierre Hyvernat : A linear category of polynomial functors (extensional part). *Logical Methods in Computer Science*, 10(2), 2014.

[31] Pierre Hyvernat : The size-change termination principle for constructor based languages. *Logical Methods in Computer Science*, 10(1), 2014.

[32] Pierre Hyvernat : The size-change termination principle for constructor based languages. *Logical Methods in Computer Science*, 10(1), 2014.

[33] Pierre Hyvernat : Some properties of inclusions of multisets and contractive boolean operators. *Discrete Mathematics*, 329:69–76, 2014.

[34] Neeraj Kayal, Vineet Nair, Chandan Saha et Sébastien Tavenas : Reconstruction of full rank algebraic branching programs. *Transactions on Computing Theory TOCT*, 11(1):2 :1–2 :56, 2019.

[35] Neeraj Kayal, Chandan Saha et Sébastien Tavenas : On the size of homogeneous and of depth-four formulas with low individual degree. *Theory of Computing*, 14(16):1–46, 2018.

[36] Bertrand Kerautret et Jacques-Olivier Lachaud : Meaningful scales detection : an unsupervised noise detection algorithm for digital contours. *IPOL Journal*, 4:98–115, 2014.

[37] Jacques-Olivier Lachaud, David Coeurjolly et Jérémy Levallois : Robust and convergent curvature and normal estimators with digital integral invariants. *In* L. Najman et P. Romon, éditeurs : *Modern Approaches to Discrete Curvature*, volume 2184 de *Lecture Notes in Mathematics*, pages 293–348. Springer International Publishing, Cham, 2017.

[38] Jacques-Olivier Lachaud, Xavier Provençal et Tristan Roussillon : An output-sensitive algorithm to compute the normal vector of a digital plane. *Theor. Comput. Sci.*, 624:73–88, 2016.

[39] Jacques-Olivier Lachaud, Xavier Provençal et Tristan Roussillon : Two plane-probing algorithms for the computation of the normal vector to a digital plane. *Journal of Mathematical Imaging and Vision*, 59(1):23–39, 2017.

[40] Jacques-Olivier Lachaud et Boris Thibert : Properties of Gauss digitized shapes and digital surface integration. *Journal of Mathematical Imaging and Vision*, 54(2):162–180, 2016.

[41] Rodolphe Lepigre et Christophe Raffalli : Practical subtyping for curry-style languages. *ACM Trans. Program. Lang. Syst.*, 2018.

[42] Jérémy Levallois, David Coeurjolly et Jacques-Olivier Lachaud : Scale-space feature extraction on digital surfaces. *Computers & Graphics*, 51:177–189, 2015. International Conference Shape Modeling International.

[43] Meena Mahajan, Nitin Saurabh et Sébastien Tavenas : VNP=VP in the multilinear world. *Inf. Process. Lett.*, 116(2):179–182, 2016.

[44] Karim Nour et Mohamed Ziadeh : A revised completeness result for the simply typed lambda-mu-calculus using realizability semantics. *Logical Methods in Computer Science*, 13:1–13, 2017.

[45] Xavier Provençal et Laurent Vuillon : Discrete segments of Z3 constructed by synchronization of words. *Discrete Applied Mathematics*, 183:102–117, 2015. Special Issue on Discrete Geometry for Computer Imagery.

[46] Christophe Reutenauer et Laurent Vuillon : Palindromic closures and Thue-Morse substitution for Markoff numbers. *Uniform distribution theory*, 2(2):25–35, 2017.

[47] Sébastien Tavenas : Improved bounds for reduction to depth 4 and depth 3. *Inf. Comput.*, 240:2–11, 2015.

[48] Jean-Louis Verger-Gaugry : Rényi-Parry germs of curves and dynamical zeta functions associated with real algebraic numbers. *RIMS Kôkyûroku Bessatsu*, B46:241–247, 2014.

[49] Jean-Louis Verger-Gaugry : On the conjecture of Lehmer, limit Mahler measure of trinomials and asymptotic expansions. *Unif. Distrib. Theory*, 11:79–139, 2016.

[50] Laurent Vuillon et Claire Lesieur : From local to global changes in proteins : a network view. *Current Opinion in Structural Biology*, 31:1–8, 2015. Theory and simulation/Macromolecular machines and assemblies.

[51] K. Worytkiewicz, K. Hess, P.E. Parent et A. Tonks : Corrigendum to : A model structure à la thomason on 2-Cat. *Journal of Pure and Applied Algebra*, 220(12):4017–4023, 2016.

### *1.1.2. Livres*

## Publication de livres - Équipe LIMD

[1] R. David, P. Hyvernat, K. Nour et C. Raffalli : *Les démonstrations mathématiques*. Ellipses, 2017.

### *1.1.3. Articles d'ouvrages*

## Articles ou chapitres publiés dans des ouvrages - Équipe LIMD

[1] Jacques-Olivier Lachaud, David Coeurjolly et Jérémy Levallois : Robust and convergent curvature and normal estimators with digital integral invariants. *In* L. Najman et P. Romon, éditeurs : *Modern Approaches to Discrete Curvature*, volume 2184 de *Lecture Notes in Mathematics*, pages 293–348. Springer International Publishing, Cham, 2017.

[2] Claire Lesieur et Laurent Vuillon : From tilings to fibers a bio-mathematical aspects of fold plasticity. *In* Claire Lesieur, éditeur : *Oligomerization of Chemical and Biological Compounds*, chapitre 13. IntechOpen, Rijeka, 2014.

### *1.1.4. Colloques, congrès, séminaires*

## Articles publiés dans des actes de colloques - Équipe LIMD

[1] D. Antunes, J.-O. Lachaud et H. Talbot : Digital curvature evolution model for image segmentation. *In International Conference on Discrete Geometry for Computer Imagery (DGCI'2019),*

*Marne-la-Vallée, France*, volume 11414 de *Lecture Notes in Computer Science*, pages 15–26. Springer, 2019.

[2] Mitali Bafna, Satyanarayana V. Lokam, Sébastien Tavenas et Ameya Velingker : On the sensitivity conjecture for read-k formulas. *In Proceedings of Symposium on Mathematical Foundations of Computer Science (MFCS)*, pages 16 :1–16 :14, 2016.

[3] Jean-Daniel Boissonnat, Karthik C. S. et Sébastien Tavenas : Building efficient and compact data structures for simplicial complexes. *In Proceedings of Symposium on Computational Geometry (SoCG)*, pages 642–656, 2015.

[4] Thomas Caissard, David Coeurjolly, Jacques-Olivier. Lachaud et Tristan Roussillon : Heat kernel Laplace-Beltrami operator on digital surfaces. *In* W. G. Kropatsch, N. M. Artner et I. Janusch, éditeurs : *Discrete Geometry for Computer Imagery : 20th IAPR International Conference, DGCI 2017, Vienna, Austria, September 19 – 21, 2017, Proceedings*, volume 10502 de *Lecture Notes in Computer Science*, pages 241–253, Cham, 2017. Springer International Publishing.

[5] Annette Casagrande, Edisson Loza-Aguirre et Laurent Vuillon : Improving strategic scanning information analysis : An alternative measure for information proximity evaluation. *In 2015 International Conference on Enterprise Systems (ES)*, pages 1–8, Oct 2015.

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[7] David Coeurjolly, Pierre Gueth et Jacques-Olivier Lachaud : Regularization of voxel art. *In SIGGRAPH Talk 2018*, 2018.

[8] Simon Colin, Rodolphe Lepigre et Gabriel Scherer : Unboxing mutually recursive type definitions in ocaml. *In Proceedings of JFLA, Les Rousses, France, 30th January to 2nd February 2019.*, 2019.

[9] Louis Cuel, Jacques-Olivier Lachaud, Quentin Mérigot et Boris Thibert : Robust normal estimation using order-k voronoi covariance. *In Proc. 30th European Workshop on Computational Geometry (EuroCG 2014)*, Dead Sea, Israel, March 3-5 2014.

[10] Louis Cuel, Jacques-Olivier Lachaud et Boris Thibert : Voronoi-based geometry estimator for 3d digital surfaces. *In* Elena Barcucci, Andrea Frosini et Simone Rinaldi, éditeurs : *Proc. Int. Conf. on Discrete Geometry for Computer Imagery (DGCI'2014), Sienna, Italy*, volume 8668 de *Lecture Notes in Computer Science*, pages 134–149. Springer International Publishing, 2014.

[11] Eric Domenjoud, Bastien Laboureix et Laurent Vuillon : Facet connectedness of arithmetic discrete hyperplanes with non-zero shift. *In Discrete Geometry for Computer Imagery*. Springer International Publishing, 2019.

[12] Eric Domenjoud, Xavier Provençal et Laurent Vuillon : Facet connectedness of discrete hyperplanes with zero intercept : The general case. *In* Elena Barcucci, Andrea Frosini et Simone Rinaldi, éditeurs : *Discrete Geometry for Computer Imagery*, pages 1–12, Cham, 2014. Springer International Publishing.

[13] Paolo Dulio, Andrea Frosini, Simone Rinaldi, Lama Tarsissi et Laurent Vuillon : First steps in the algorithmic reconstruction of digital convex sets. *In* Srečko Brlek, Francesco Dolce, Christophe Reutenauer et Élise Vandomme, éditeurs : *Combinatorics on Words*, pages 164–176, Cham, 2017. Springer International Publishing.

[14] Clovis Eberhart et Tom Hirschowitz : Justified sequences in string diagrams : a comparison between two approaches to concurrent game semantics. *In* Filippo Bonchi et Barbara König, éditeurs : *Proceedings of the 7th International Conference on Algebra and Coalgebra in Computer Science*, volume 72 de *LIPIcs*, pages 10 :1–10 :16. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2017.

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[16] Clovis Eberhart, Tom Hirschowitz et Alexis Laouar : Template games, simple games, and Day convolution. *In Proceedings of the 3rd International Conference on Formal Structures for Computation and Deduction*, LIPIcs. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2019. To appear.

[17] Clovis Eberhart, Tom Hirschowitz et Thomas Seiller : An intensionally fully-abstract sheaf model for pi. *In* Lawrence S. Moss et Pawel Sobocinski, éditeurs : *Proceedings of the 6th International Conference on Algebra and Coalgebra in Computer Science*, volume 35 de *LIPIcs*, pages 86–100. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2015. Best paper award (*ex æquo*).

[18] Marion Foare, Jacques-Olivier Lachaud et Hugues Talbot : Image restoration and segmentation using the Ambrosio-Tortorelli functional and discrete calculus. *In Pattern Recognition (ICPR), 2016 23rd International Conference on*, pages 1418–1423, Cancun, Mexico, 2016. IEEE.

[19] Marion Foare, Jacques-Olivier Lachaud et Hugues Talbot : Numerical implementation of the ambrosio-tortorelli functional using discrete calculus and application to image resoration and inpainting. *In Proc. 1st Workshop on Reproducible Research in Pattern Recognition (RRPR2016)*, pages 91–103, Cancun, Mexico, 2016.

[20] Ignacio García-Marco, Pascal Koiran et Sébastien Tavenas : Log-concavity and lower bounds for arithmetic circuits. *In Proceedings of Mathematical Foundations of Computer Science (MFCS)*, pages 361–371, 2015.

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[22] Florent Grélard, Fabien Baldacci, Anne Vialard et Jacques-Olivier Lachaud : Precise cross-section estimation on tubular organs. *In* George Azzopardi et Nicolai Petkov, éditeurs : *Proc. Computer Analysis of Images and Patterns (CAIP'2015), La Valetta, Malta*, volume 9257 de *Lecture Notes in Computer Science*, pages 277–288. Springer International Publishing, 2015.

[23] André Hirschowitz, Tom Hirschowitz et Nicolas Tabareau : Wild omega-categories for the homotopy hypothesis in type theory. *In Proceedings of the 22nd International Conference on Typed Lambda Calculi and Applications*, volume 38 de *LIPIcs*, pages 226–240. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2015.

[24] Karthik C. S. et Sébastien Tavenas : On the sensitivity conjecture for disjunctive normal forms. *In Proceedings of Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, pages 15 :1–15 :15, 2016.

[25] Neeraj Kayal, Vineet Nair, Chandan Saha et Sébastien Tavenas : Reconstruction of full rank algebraic branching programs. *In Proceedings of Computational Complexity Conference (CCC)*, pages 21 :1–21 :61, 2017.

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[28] Bertarnd Kerautret, Adrien Krähenbühl, Isabelle Debled-Rennesson et Jacques Olivier Lachaud : 3d geometric analysis of tubular objects based on surface normal accumulation. *In* Vittorio Murino et Enrico Puppo, éditeurs : *Proc. Image Analysis and Processing (ICIAP 2015), Genova, Italy*, volume 9279 de *Lecture Notes in Computer Science*, pages 319–331. Springer International Publishing, 2015.

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[30] Bertrand Kerautret, Adrien Krähenbühl, Isabelle Debled-Rennesson et Jacques-Olivier Lachaud : On the implementation of centerline extraction based on confidence vote in accumulation map. *In International Workshop on Reproducible Research in Pattern Recognition*, pages 116–130. Springer, Cham, 2016.

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[32] Jacques-Olivier Lachaud, Xavier Provençal et Tristan Roussillon : Computation of the normal vector to a digital plane by sampling significant points. *In* N. Normand, J. Guédon et F. Autrusseau, éditeurs : *Discrete Geometry for Computer Imagery - 19th IAPR International Conference, DGCI 2016, Nantes, France, April 18-20, 2016. Proceedings*, volume 9647 de *Lecture Notes in Computer Science*, pages 194–205. Springer, 2016.

[33] Rodolphe Lepigre : PML2 : integrated program verification in ML. *In 23rd International Conference on Types for Proofs and Programs, TYPES 2017, May 29-June 1, 2017, Budapest, Hungary*, pages 4 :1–4 :27, 2017.

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[36] Jérémy Levallois, David Coeurjolly et Jacques-Olivier Lachaud : Parameter-free and multigrid convergent digital curvature estimators. *In* Elena Barcucci, Andrea Frosini et Simone Rinaldi, éditeurs : *Proc. Int. Conf. on Discrete Geometry for Computer Imagery (DGCI'2014), Sienna, Italy*, volume 8668 de *Lecture Notes in Computer Science*, pages 162–175. Springer International Publishing, 2014.

[37] Hélène Perrier, Jérémy Levallois, David Coeurjolly, Jean-Philippe Farrugia, Jean-Claude Iehl et Jacques-Olivier Lachaud : Interactive curvature tensor visualization on digital surfaces. *In* N. Normand, J. Guédon et F. Autrusseau, éditeurs : *Discrete Geometry for Computer Imagery - 19th IAPR International Conference, DGCI 2016, Nantes, France, April 18-20, 2016. Proceedings*, volume 9647 de *Lecture Notes in Computer Science*, pages 282–294. Springer, 2016.

[38] T. Roussillon et J.-O. Lachaud : Digital plane recognition with fewer probes. *In International Conference on Discrete Geometry for Computer Imagery*, volume 11414 de *Lecture Notes in Computer Science*, pages 380–393. Springer, 2019.