

CURRICULUM VITÆ of Marianne AKIAN

Current position: Research Director at INRIA Saclay Île-de-France (since Sept 08)

Institution: Inria (Institut National de Recherche en Informatique et Automatique) Saclay Île-de-France and CMAP, Ecole polytechnique CNRS

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Personnal data:

Date and place of birth: 2nd March 1964, Marseille, France

Nationality: French

Family situation: unmarried, 2 children

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Expertise area

Optimal deterministic and stochastic control and zero-sum games by the dynamic programming method: mean-payoff or ergodic problems, Hamilton-Jacobi-Bellman equations, numerical analysis and algorithms (policy iterations, multigrid methods, tropical numerical methods).

Max-plus or tropical algebras (linear algebra, convexity, links with zero-sum games, idempotent measures, links with continuous lattices, applications to perturbations of eigenvalues and large deviations).

Monotone nonexpansive maps and nonlinear Perron-Frobenius theory with applications to optimal control and zero-sum games.

Some application fields: portfolio selection, pagerank optimization, pricing, economy,

Degree

July 82: Admission to **ENSJF** (Ecole Normale Supérieure de Jeunes Filles), section Sciences, group A (Mathematics), rank: 2nd.

June 85: Admission to the **Agrégation** of Mathematics, option: Numerical Analysis.

June 85: **DEA** (Diplôme d'études approfondies, equivalent to Master 2) of Numerical Analysis at the University Pierre et Marie Curie (Paris 6).

1990: **PhD Thesis** of the University Paris 9-Dauphine; Speciality: Mathématiques et Automatique: Title: Méthodes multigrilles en contrôle stochastique; Thesis director: Alain Bensoussan; Jury: Y. Meyer (président), A. Bensoussan, P.L. Lions, J.F. Maitre, O. Pironneau, J.P. Quadrat.

2007: **Habilitation à Diriger des Recherches** of University Pierre et Marie Curie, Spéciality : Mathématiques. Title : Algèbre max-plus, applications monotones contractantes et équations aux dérivées partielles : trois approches du contrôle optimal; Jury : John Mallet-Paret, Geert Jan Olsder, Marc Quincampoix (rapporteurs), Nicole El Karoui, Albert Fathi, Pierre-Louis Lions (président), Jean-Pierre Quadrat, Alain Rouault, Sylvain Sorin.

Professional history

Sept. 82–Aug 86: “Élève fonctionnaire” at ENSJF

Sept. 86–Sept. 88: “Assistant Normalien Doctorant de Mathématiques” at University Paris-IX-Dauphine

Sept 88–Sept 90: “Chargée de recherche” 2nd class at INRIA, Rocquencourt.

Sept 90–Dec 07: “Chargée de recherche” 1st class at INRIA, Rocquencourt.

Jan 08–Aug 08: “Chargée de recherche” 1st class at INRIA, Saclay Île-de-France.

Supervision of research activities

PhD supervision and co-supervision:

4 PhD thesis directions/supervisions+ 1 in progress: Paul Poncet (07-11), Sylvie Detournay (08–12), Andrea Marchesini (12-15, with S. Gaubert co-supervisor), Eric Fodjo (13–18), Shanqing Liu (20–, with S. Gaubert co-supervisor).

5 PhD co-supervisions+ 2 in progress: Asma Lakhoua (03–07, director S. Gaubert), Olivier Fercoq (09-12, director S. Gaubert), Antoine Hochart (13-16, director S. Gaubert), Jean-Bernard Eytard (15–18, director S. Gaubert), Benoît Tran (17–20, director J.P. Chancelier), Omar Saadi (18–21, director S. Gaubert), Antoine Bereau (21–, director S. Gaubert).

Postdoc supervision:

Sophie Bismuth (99-00), Cormac Walsh (01-02), Adi Niv (14-16), Hanieh Tavakolipour (20-21).

Research projects responsibility:

Co-PI with Pierre-Alexandre Bliman of a NSF-INRIA cooperation with Roger Nussbaum (2000-2002);

Co-head of the Inria project-teams MAXPLUS and TROPICAL, with S. Gaubert as the head;

Co-PI of a white project iCODE on “stability of switching systems” (2014-2016);

Co-PI of a white project iCODE on “New perspectives in the numerical solution of Hamilton-Jacobi-Bellman partial differential equations” (2019-2020).

Visibility

Invitations in view of collaborations:

BRIMS, HP-Labs, Bristol (one week in 2000, J. Gunawardena);

Rutgers U. (one week in 2001 and 2002, R. Nussbaum);

Nottingham Trent university (one week in 2002 and 2005, V. Kolokoltsov);

LAMSIN, ENIT (Tunis) (one week in 2004 and 2005, H. El Fekhi);

Poncelet laboratory, Moscow Independent University (one week in 2006, G. Litvinov);

IMAR (Romania) (one week, I. Singer);

Bar Ilan (1 week, in 2015, L. Rowen);

Moscow state U. (one week 2015, A. Guterman).

Invitations to thematic semesters:

MSRI (Berkeley, USA, Research member 1 month in 2009 for the program “Tropical Geometry”)

Institut Mittag Leffler (Stockholm) (from Jan. 15 to March 3, 2018), for the program “Tropical Geometry, Amoebas and Polytopes”.

Invitation at IPAM (UCLA) for the program “High Dimensional Hamilton-Jacobi PDEs”. <http://www.ipam.ucla.edu/programs/long-programs/high-dimensional-hamilton-jacobi-pdes/>
Cancelled because of Covid19.

Invitations to workshops:

- International Workshop on “Idempotent Mathematics and Mathematical Physics”, organised by V. Maslov et G. Litvinov, at ESI (The International Erwin Schroedinger Institute), Vienne, feb. 2003. Talk: “Perturbation of eigenvalues and min-plus algebra”.
- Workshop “Idempotent and Tropical Mathematics and problems of Mathematical Physics”, organised by Litvinov, Maslov, Sobolevskiy, et Sergeev, at Independent University Moscow, 25-30 august 2007. Talk: “Representation of stationnary solutions of Hamilton-Jacobi-Bellman equations: a max-plus point of view”.
- “Montreal workshop on idempotent and tropical mathematics”, 29 june-3 july 2009. Talk: “Tropical linear independence, signed linear equations, and mean payoff games”.
- “Connections for Women: Tropical Geometry”, MSRI, Berkeley, 22-23 August 2009. Talk: “Tropical linear independence and symmetrization of the tropical semiring”.
- AFOSR Workshop on Computational Control, Monterey, 9-10 nov. 2009. Talk: “The max-plus finite element method for solving first order Hamilton-Jacobi equations”.
- EPSRC Symposium Workshop on Game theory for finance, social and biological sciences (GAM), Warwick (UK), 14-17 April 2010. Talk: “Tropical Polyhedra are Equivalent to Mean Payoff Games”.
- BIRS workshop “Advancing numerical methods for viscosity solutions and applications”, Banff, Canada, Feb. 13-18, 2011. Talk “Max-plus algebra in the numerical solution of Hamilton-Jacobi and Isaacs equations”.
- Meeting of the LMS Joint Research Group “Tropical Mathematics and its Applications”, Birmingham, 28 June 2011. Talk: “Max-plus algebra for Hamilton-Jacobi and Isaacs equations”.
- Workshop “Hilbert Geometries”, organized by B. Lemmens and C. Vernicos, CIRM, Luminy, 9–12 jan. 2012. Talk: “Fixed points and eigenvectors of convex monotone dynamical systems”.
- Workshop “Tropical and idempotent Mathematics”, Moscow, 26-31 august 2012 (Grant RFBR–CNRF 11-01-93106). Talk: “Fixed points of discrete convex monotone dynamical systems”.
- Workshop “Tropical Mathematics and its Applications Meeting”, LMS Joint Research Group, Univ. Birmingham, 16 may 2013. Talk: “Majorisation inequalities for valuations of eigenvalues”.
- “Structured Matrix Days”, Limoges, May 2014. Talk: “Log-majorization of eigenvalues of matrix polynomials and tropical scaling”.
- 4th International Conference on Matrix methods in Mathematics and Applications (MMMA-2015), Moscow, August 24-28, 2015. Talk: “Majorization inequalities for valuations of eigenvalues using tropical algebra”.
- Workshop “Numerical methods for Hamilton-Jacobi equations in optimal control and related fields”, Radon Institute, Austrian Academy of Sciences, Linz, Austria, Nov. 21 - Nov. 25, 2016. Talk: “Solving Hamilton-Jacobi-Bellman equations by combining a max-plus linear approximation and a probabilistic numerical method”.
- Dagstuhl Seminar “Algorithms and Effectivity in Tropical Mathematics and Beyond”, Nov. 28 - Dec. 02, 2016. Talk: “Majorization inequalities for valuations of eigenvalues using tropical algebra”.

- Workshop “Numerical methods for optimal control problems: algorithms, analysis and applications”, IN-daM, Roma, Italy, 19-23 June 2017. Talk: “Probabilistic max-plus schemes for solving Hamilton–Jacobi–Bellman equations”.
- Workshop “Jeux dynamiques à somme nulle: temps discret, temps continu”, Fréjus, 17–19 oct. 2017. Talk: “Érgodicité des jeux à somme nulle”.
- Workshop “Combinatorics, polytopes, and complexity”, Mittag-Leffler institute, Feb. 19-23, 2018. Talk: “Majorization inequalities for valuations of eigenvalues”.
- International workshop on game theory, IHP, June 2018, Paris. Talk: “The operator approach to entropy games”.
- Dagstuhl Seminar “Shape Analysis: Euclidean, Discrete and Algebraic Geometric Methods”, Oct. 2018, Dagstuhl. Talk: “Tropical geometry, Optimal Control and Mean-payoff Games”.
- Workshop “Jeux dynamiques: temps discret, temps continu”, Fréjus, Oct. 2019. Talk: “De l’ergodicité des jeux à somme nulle à l’existence et l’unicité de vecteurs propres de Perron non linéaires”.
- Journées annuelles du GDR MOA, Rennes, Oct. 2019. Talk: “Complexity of policy and value iterations for ergodic zero-sum two player games: non-linear Perron-Frobenius methods”.
- IPAM Workshop I: High Dimensional Hamilton-Jacobi Methods in Control and Differential Games, March 30 - April 3, 2020 (online). Programme. Talk: “Probabilistic max-plus schemes for solving Hamilton-Jacobi-Bellman equations”.
- Workshop “Tropical geometry and the geometry of linear programming”, HIM (Hausdorff Research Institute for Mathematics), Bonn, Germany, 20-24 Sept. 2021, hybrid conference. Programme. Talk: “Tropical linear regression and mean payoff games: or, how to measure the distance to equilibria”.
- Workshop Jeux Dynamiques, Quimper, 20-22 oct. 2021. Talk: “Ambitropical convexity: The geometry of fixed point sets of Shapley operators”.

Jury and reports of PhD thesis (in addition to co-supervised PhD students):

- Jury member of PhD of M. Sharify, sept. 2011, École polytechnique.
- Reviewer and Jury member of PhD of Jean-Christophe Alais (U. Paris Est, ENPC), 16 dec. 2013.
- Jury member of PhD of Mohamed Assellaou (ENSTA, Palaiseau), dec. 2015.
- Reviewer and Jury member of PhD of Henri Gerard (U. Paris Est, ENPC), 26 Oct. 2018.
- Jury member of PhD of Florian Schanzenbächer (Université Paris Est), 5 June 2020.
- Reviewer of PhD of Diego Deplano (Univ. Cagliari, Italie), Jan. 2021.
- Jury member of PhD of Dylan Dronnier (U. Paris Est, ENPC), scheduled on 26 nov. 2021.
- Reviewer and Jury member of PhD of Adrien Lefranc (U. Paris Est, ENPC), scheduled on 8 dec. 2021.
- Jury member of PhD of Aurélien Desoeuvres (U. Montpellier), scheduled on 9 dec. 2021.

Teaching

(Sept. 86–June 88) : University Paris IX-Dauphine as an “Assistant Normalien Doctorant” in Mathematics (192 hours by year during 2 years, in first and third year of University).

(93/94) : ENSTA (École Nationale Supérieure des Techniques avancées) : 2nd year, Automatic control (main courses by Laurent El Ghaoui) (24 hours).

(97/98) : Courses of Probability and stochastic processes in 2nd then 1st year at ISTM (Institut Supérieur de Technologie et de Management), called now “ESIEE Management”) (15+16 hours).

(Sept. 97–Dec. 05) : Mathematics in 1st year at École des Mines de Paris” (main courses by Francis

Maisonneuve) (15+15 hours by year).

(08–12) : Lecture of “Discrete time stochastic control” in the 2nd year of Master MMMEF (Modélisation et Méthodes Mathématiques en Économie et Finance) of Paris 1 (18 hours).

(15–) : Lecture “Markov decision processes: dynamic programming and applications” common to 3rd year of ENSTA and **Master 2 “Optimisation”** of University Paris Saclay, course shared with Jean-Philippe Chancelier (15 hours each) until 2019, and given alone since 2020 (30 hours).

Service

- Member of Organization Committee of **IFAC TDS’03** (IFAC workshop on Time-Delay Systems) 8-10 sept. 2003.
- Member of INRIA Evaluation Committee june 2005–june 2011.
- Member of INRIA hiring committee: CR1, CR2-Sophia and CR2-Nancy 2006, CR2-Nancy and CR1-Nancy 2007, CR2-Sophia 2008, CR Bordeaux and DR2 2010, CR Lille and DR2 2011; CR2-Saclay 2015, 2016, 2018, 2020.
- Member of Program Committee of **Valuetools’06** (International Conference on Performance Evaluation Methodologies and Tools, Oct. 11-13, 2006) and **Valuetools’07** (Oct. 23-25, 2007).
- Member of **CMAP laboratory council**: 2009–2014 and 2017–2019.
- Organization of the session “Max-plus methods for optimal control and zero-sum games”, at “53rd IEEE Conference on Decision and Control”, Los Angeles, USA, Dec. 2014.
- Co-organization (with S. Gaubert, W. McEneaney, and G. Viger) of minisymposium “Dynamic Games and Operators” at SIAM CT’15 (SIAM Conference on Control and its Applications) 8-10 July 2015, Paris.
- Co-organization of “workshop on switching dynamics & verification”, IHP, Jan. 2016, as part of Icode white project “Stabilité et stabilisation des systèmes commutés”, see <http://www.cmap.polytechnique.fr/~sdv2016/>.
- Member of “comité de liaison **SMAI-MODE**” June 2015–May 2021.
- **Vice-head of INRIA hiring committee** for Inria Saclay 2016.
- Member of the committee of **PGMO PhD award** 2016.
- Member of **Inria Scientific board** (June 2019-).
- Co-organization (with S. Gaubert, A. Peperko, et G. Viger) of the special session “Order preserving operators on cones and applications” at IWOTA 2019, 22-26 July, 2019, Lisbon.
- Member of **the hiring committee** for a professor of Applied Mathematics at Avignon U., 2019.
- Co-organization of the “**ICODE** workshop on numerical solution of Hamilton-Jacobi-Bellman equations”, U. Paris-Diderot, 8-10 Jan. 2020, as part of the iCODE white project “New perspectives in the numerical solution of Hamilton-Jacobi-Bellman partial differential equations”, see <https://indico.math.cnrs.fr/e/Icode-HJB-workshop>.
- **Chair** with Hasnaa Zidani of the organization committee of **SMAI MODE 2020**, see <http://smai-mode2020.inria.fr/>. 7-9 sept. 2020.
- Member of the scientific committee of **SMAI MODE 2020**.
- Member of **the hiring committee** for a Maître de Conférence (assistant professor) in Applied Mathematics (Optimization) at Limoges U., in 2020 and 2021.
- Member of **the hiring committee** for a Maître de Conférence (assistant professor) in Computer Science (Optimization) at Clermont U., in 2020 and 2021.
- Co-organization (with J. Darbon, P. Dower, and W. McEneaney) of minisymposium “Optimal control and Games” at SIAM CT’21 (SIAM Conference on Control and its Applications) July 2021, online.

Complete list of publications

Some pdf files are available on my Web page <http://www.cmap.polytechnique.fr/~akian/>.

PhD thesis and HDR

- [T1] M. Akian. *Méthodes multigrilles en contrôle stochastique*. Thèse de Doctorat, Université Paris IX-Dauphine, Paris, 1990. (cf. <http://www.inria.fr/rrrt/tu-0107.html>).
- [T2] M. Akian. *Algèbre max-plus, applications monotones contractantes et équations aux dérivées partielles : trois approches du contrôle optimal*. Habilitation à Diriger des Recherches, Université Pierre et Marie Curie (Paris 6), 2007. (cf. <http://www.cmap.polytechnique.fr/~akian/publis/hdr-akian.pdf>).

Articles in peer-reviewed international journals

- [J1] Max Plus¹. L'algèbre (max, +) et sa symétrisation ou l'algèbre des équilibres. *C. R. Acad. Sci. Paris Sér. II Méc. Phys. Chim. Sci. Univers Sci. Terre*, 311(4):443–448, 1990.
- [J2] M. Akian, J. L. Menaldi, and A. Sulem. Multi-asset portfolio selection problem with transaction costs. *Math. Comput. Simulation*, 38(1-3):163–172, 1995. Probabilités numériques (Paris, 1992).
- [J3] M. Akian, J. L. Menaldi, and A. Sulem. On an investment-consumption model with transaction costs. *SIAM J. Control Optim.*, 34(1):329–364, 1996.
- [J4] J. P. Quadrat and Max-Plus Working Group². Min-plus linearity and Statistical Mechanics. *Markov Process. Related Fields*, 3(4):565–587, 1997. Statistical Mechanics of large networks (Rocquencourt, 1996).
- [J5] M. Akian, R. B. Bapat, and S. Gaubert. Asymptotics of the Perron eigenvalue and eigenvector using max-algebra. *C. R. Acad. Sci. Paris Sér. I Math.*, 327:927–932, 1998. See also Rapport de recherche INRIA 3450.
- [J6] M. Akian. Densities of idempotent measures and large deviations. *Trans. Amer. Math. Soc.*, 351(11):4515–4543, 1999.
- [J7] M. Akian and P.-A. Bliman. On super-high frequencies in discontinuous 1st-order delay-differential equations. *J. Differential Equations*, 162(2):326–358, 2000.
- [J8] M. Akian, A. Sulem, and M. Taksar. Dynamic optimization of long-term growth rate for a portfolio with transaction costs and logarithmic utility. *Math. Finance*, 11(2):153–188, 2001.
- [J9] M. Akian and S. Bismuth. Instability of rapidly-oscillating periodic solutions for discontinuous differential delay equations. *Differential Integral Equations*, 15(1):53–90, 2002.

¹Collective name given to the working group on Discrete Event Systems theory at INRIA (INRIA project Méta2) comprising, at the moment of this article, M. Akian, G. Cohen, S. Gaubert, R. Nihoukhah et J.P. Quadrat.

²Currently comprising: M. Akian, G. Cohen, S. Gaubert, M. Mc Gettrick, J.P. Quadrat and M. Viot

- [J10] M. Akian, P.-A. Bliman, and M. Sorine. Control of delay systems with relay. *IMA J. Math. Control Inform.*, 19(1-2):133–155, 2002. Special issue on analysis and design of delay and propagation systems.
- [J11] M. Akian, S. Gaubert, and V. Kolokoltsov. Invertibility of functional Galois connections. *C. R. Acad. Sci. Paris, Ser. I* 335(11):883–888, 2002.
- [J12] M. Akian and S. Gaubert. Spectral theorem for convex monotone homogeneous maps, and ergodic control. *Nonlinear Analysis. Theory, Methods & Applications*, 52(2):637–679, 2003. See also arXiv:math/0110108.
- [J13] M. Akian and I. Singer. Topologies on lattice ordered groups, separation from closed downward sets and conjugations of type Lau. *Optimization*, 52(6):629–672, 2003.
- [J14] M. Akian, R. Bapat, and S. Gaubert. Perturbation of eigenvalues of matrix pencils and the optimal assignment problem. *C. R. Acad. Sci. Paris, Série I*, 339(2):103–108, 2004. See also Rapport de recherche INRIA 5120 or arXiv:math.SP/0402438.
- [J15] M. Akian, S. Gaubert, B. Lemmens, and R. Nussbaum. Iteration of order preserving subhomogeneous maps on a cone. *Math. Proc. Cambridge Philos. Soc.*, 140(1):157–176, 2006. See also arXiv:math.DS/0410084.
- [J16] M. Akian, S. Gaubert, and A. Lakhoua. The max-plus finite element method for solving deterministic optimal control problems: basic properties and convergence analysis. *SIAM J. Control Optim.*, 47(2):817–848, 2008. See also arXiv:math.OC/0603619.
- [J17] M. Akian, B. David, and S. Gaubert. Un théorème de représentation des solutions de viscosité d’une équation d’Hamilton-Jacobi-Bellman ergodique dégénérée sur le tore. *C. R. Acad. Sci. Paris, Ser. I*, 346:1149–1154, 2008.
- [J18] M. Akian, S. Gaubert, and C. Walsh. The max-plus Martin boundary. *Doc. Math.*, 14:195–240, 2009. See also arXiv:0412408.
- [J19] Marianne Akian, Stéphane Gaubert, and Bas Lemmens. Stability and convergence in discrete convex monotone dynamical systems. *Journal of Fixed Point Theory and Applications*, 9:295–325, 2011. 10.1007/s11784-011-0052-1.
- [J20] M. Akian, S. Gaubert, V. Nitica, and I. Singer. Best approximation in max-plus semimodules. *Linear Algebra and its Applications*, 435(12):3261–3296, 2011. See also arXiv:1012.5492.
- [J21] M. Akian, S. Gaubert, and A. Guterman. Tropical polyhedra are equivalent to mean payoff games. *Internat. J. Algebra Comput.*, 22(1):1250001, 43, 2012. See also arXiv:0912.2462.
- [J22] M. Akian and S. Detournay. Multigrid methods for two-player zero-sum stochastic games. *Numer. Linear Algebra Appl.*, 19(2):313–342, 2012. See also arXiv:1107.1653.
- [J23] O. Fercoq, M. Akian, M. Bouhtou, and S. Gaubert. Ergodic control and polyhedral approaches to pagerank optimization. *IEEE TAC*, 58(1):134–148, 2013. See also arXiv:1011.2348.
- [J24] M. Akian, S. Gaubert, and A. Marchesini. Tropical bounds for eigenvalues of matrices. *Linear Algebra and its Applications*, 446:281–303, January 2014. See also arXiv:1309.7319.
- [J25] M. Akian, S. Gaubert, and A. Hochart. Ergodicity conditions for zero-sum games. *Discrete and Continuous Dynamical Systems - Series A*, 35(9):31, September 2015. See also arXiv:1405.4658.

- [J26] M. Akian, S. Gaubert, and R. Nussbaum. Uniqueness of the fixed point of nonexpansive semidifferentiable maps. *Transactions of the American Mathematical Society*, 368(2), February 2016. Published online on February 19, 2015. See also arXiv:1201.1536.
- [J27] M. Akian, S. Gaubert, and R. Bapat. Non-archimedean valuations of eigenvalues of matrix polynomials. *Linear Algebra and its Applications*, 498:592–627, June 2016. See also arXiv:1601.00438.
- [J28] M. Akian, S. Gaubert, and M. Sharify. Log-majorization of the moduli of the eigenvalues of a matrix polynomial by tropical roots. *Linear Algebra and its Applications*, 528:394–435, 2017. See also arXiv:1304.2967.
- [J29] Marianne Akian, Stéphane Gaubert, and Antoine Hochart. Minimax representation of nonexpansive functions and application to zero-sum recursive games. *Journal of Convex Analysis*, 25(1), February 2018. See also arXiv:1605.04518.
- [J30] Marianne Akian, Stéphane Gaubert, and Adi Niv. Tropical compound matrix identities. *Linear Algebra and its Applications*, 551:162–206, August 2018. See also arXiv:1702.00980.
- [J31] Marianne Akian, Stéphane Gaubert, and Antoine Hochart. Generic uniqueness of the bias vector of finite stochastic games with perfect information. *Journal of Mathematical Analysis and Applications*, 457:1038–1064, 2018. See also arXiv:1610.09651.
- [J32] Marianne Akian, Stéphane Gaubert, Julien Grand-Clément, and Jérémie Guillaud. The operator approach to entropy games. *Theory of Computing Systems*, 63:1089–1130, 2019. See also arXiv:1904.05151.
- [J33] Marianne Akian, Stéphane Gaubert, and Antoine Hochart. A game theory approach to the existence and uniqueness of nonlinear perron-frobenius eigenvectors. *Discrete and Continuous Dynamical Systems - Series A*, 40:207–231, 2020. See also arXiv:1812.09871.
- [J34] Stéphane Gaubert, Marianne Akian, Xavier Allamigeon, Marin Boyet, Baptiste Colin, Théotime Grohens, Laurent Massoulié, David P. Parsons, Frederic Adnet, Érick Chanzy, Laurent Goix, Frédéric Lapostolle, Éric Lecarpentier, Christophe Leroy, Thomas Loeb, Jean-Sébastien Marx, Caroline Télion, Laurent Treluyer, and Pierre Carli. Understanding and monitoring the evolution of the covid-19 epidemic from medical emergency calls: the example of the paris area. *Comptes Rendus Mathématique*, 358(7):843–875. See also arXiv:2005.14186.
- [J35] Marianne Akian, Stéphane Gaubert, Zheng Qu, and Omar Saadi. Multiply accelerated value iteration for non-symmetric affine fixed point problems and application to markov decision processes. *SIMAX*, 2021. Accepted for publication, see arXiv:2009.10427.

Books and book chapters

- [B1] M. Akian. Résolution numérique d'équations d'Hamilton-Jacobi-Bellman au moyen d'algorithmes multigrilles et d'itérations sur les politiques. In *Analysis and optimization of systems (Antibes, 1988)*, volume 111 of *Lecture Notes in Control and Inform. Sci.*, pages 629–640. Springer, Berlin, 1988.
- [B2] M. Akian. Analyse de l'algorithme multigrille FMGH de résolution d'équations d'Hamilton-Jacobi-Bellman. In *Analysis and optimization of systems (Antibes, 1990)*, volume 144 of *Lecture Notes in Control and Inform. Sci.*, pages 113–122. Springer, Berlin, 1990.
- [B3] M. Akian, J.P. Quadrat, and M. Viot. Bellman processes. In *11th International Conference on Analysis and Optimization of Systems : Discrete Event Systems (Sophia-Antipolis, 1994)*, volume 199 of *Lecture Notes in Control and Inform. Sci.*, pages 302–311. Springer, 1994.

- [B4] S. Gaubert and Max Plus³. Methods and applications of $(\max, +)$ linear algebra. In *STACS 97 (Lübeck)*, volume 1200 of *Lecture Notes in Comput. Sci.*, pages 261–282. Springer, Berlin, 1997. See also Rapport de recherche INRIA 3088.
- [B5] M. Akian, J.-P. Quadrat, and M. Viot. Duality between probability and optimization. In J. Gunawardena, editor, *Idempotency*, Publications of the Isaac Newton Institute, pages 331–353. Cambridge University Press, 1998.
- [B6] M. Akian, S. Gaubert, and V. N. Kolokoltsov. Set coverings and invertibility of functional Galois connections. In G. L. Litvinov and V. P. Maslov, editors, *Idempotent Mathematics and Mathematical Physics*, Contemporary Mathematics, pages 19–51. American Mathematical Society, 2005. See also ESI Preprint 1447 and arXiv:math.FA/0403441.
- [B7] M. Akian, S. Gaubert, and C. Walsh. Discrete max-plus spectral theory. In G. L. Litvinov and V. P. Maslov, editors, *Idempotent Mathematics and Mathematical Physics*, Contemporary Mathematics, pages 53–77. American Mathematical Society, 2005. See also ESI Preprint 1485 and arXiv:math.SP/0405225.
- [B8] M. Akian, R. Bapat, and S. Gaubert. Max-plus algebras. In L. Hogben, editor, *Handbook of Linear Algebra (Discrete Mathematics and Its Applications)*, volume 39. Chapman & Hall/CRC, 2006. Chapter 25.
- [B9] M. Akian, S. Gaubert, and L. Ninove. The T -PageRank: a model of self-validating effects of web surfing. In *Positive systems*, volume 341 of *Lecture Notes in Control and Inform. Sci.*, pages 239–246. Springer, Berlin, 2006.
- [B10] M. Akian, S. Gaubert, and A. Guterman. Linear independence over tropical semirings and beyond. In G.L. Litvinov and S.N. Sergeev, editors, *Proceedings of the International Conference on Tropical and Idempotent Mathematics*, volume 495 of *Contemporary Mathematics*, pages 1–38. American Mathematical Society, 2009. See also arXiv:0812.3496.
- [B11] M. Akian, S. Gaubert, and V.N. Kolokoltsov. The optimal assignment problem for a countable state space. In G.L. Litvinov and S.N. Sergeev, editors, *Proceedings of the International Conference on Tropical and Idempotent Mathematics*, volume 495 of *Contemporary Mathematics*, pages 39–60. American Mathematical Society, 2009. See also arXiv:0812.4866.
- [B12] M. Akian, S. Gaubert, and A. Guterman. Tropical Cramer Determinants Revisited. In G.L. Litvinov and S.N. Sergeev, editors, *Tropical and Idempotent Mathematics and Applications*, volume 616 of *Contemporary Mathematics*, page 45. AMS, 2014. See also arXiv:1309.6298.
- [B13] Marianne Akian and Eric Fodjo. From a monotone probabilistic scheme to a probabilistic max-plus algorithm for solving Hamilton-Jacobi-Bellman equations. In Zhiping Rao Dante Kalise, Karl Kunisch, editor, *Hamilton-Jacobi-Bellman Equations: Numerical Methods and Applications in Optimal Control*, volume 21 of *Radon Ser. Comput. Appl. Math.* De Gruyter, August 2018. See also arXiv:1709.09049.
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