

# Cristian Oară

## Research Activity

### 2000–2016

#### ISI Journal Papers<sup>1</sup>

- [P1] C. Oară, A. Varga, Minimal degree coprime factorization of rational matrices, *SIAM Journal on Matrix Analysis and Applications*, Vol. 21(1), 2000, pp. 245–278. [Q1/AIS-AM]
- [P2] C. Oară, A. Varga, Computation of general inner–outer and spectral factorizations, *IEEE Transactions on Automatic Control*, Vol. 45(12), 2000, pp. 2307–2325. [Q1/AIS-A&CS]
- [P3] C. Oară, On computing normalized coprime factorizations of general rational matrices, *IEEE Transactions on Automatic Control*, Vol 46(2), 2001, pp. 286–290. [Q1/AIS-A&CS]
- [P4] V. Ionescu, C. Oară, The four block Adamjan–Arov–Krein problem for discrete–time systems, to appear in *Linear Algebra and Its Applications*, Vol. 328(1-3), 2001, pp. 95–119. [Q1/IF-M]
- [P5] C. Oară, R. Stefan, From factorizations to Riccati Equations and Back, *Revue Roumain des Sciences Techniques. Serie Electrotechnique et Energetique*, Vol 48(4), 2003, pp. 457–487.
- [P6] C. Oară, Constructive solutions to spectral and innerouter factorizations with respect to the disk, *Automatica*, full paper, Vol. 41(11), 2005, pp. 1855–1866. [Q1/AIS-A&CS]
- [P7] C. Oară, S. Sabau, Squaring down descriptor systems: Constructive solutions and numerical algorithms, *IEEE Transactions on Automatic Control*, Vol.54(4), 2009, pp. 866–870. [Q1/AIS-A&CS]
- [P8] C. Oară, S. Sabau, All doubly coprime factorizations of a general rational matrix, *Automatica*, Vol. 45(8), 2009, pp. 1960–1964. [Q1/AIS-A&CS]
- [P9] C. Oară, R. Andrei, Zero cancellation for general rational matrix functions, *Linear Algebra and its Applications*, Vol. 431(11), 2009, pp. 2000–2023. [Q1/IF-M]
- [P10] C. Oară, S. Sabau, Minimal indices cancellation and rank revealing factorizations for rational matrix functions, *Linear Algebra and its Applications*, Vol. 431(10), 2009, pp. 1785–1814. [Q1/IF-M]
- [P11] M. Jungers, C. Oară, H. Abou-Kandil, R. tefan, General matrix pencil techniques for solving non-symmetric algebraic Riccati equations, *SIAM Journal on Matrix Analysis and Applications*, Vol. 31(3), 2009, pp. 1257–1278. [Q1/AIS-AM]
- [P12] C. Oară, C. Flutur, Nonminimal spectral factorization of a descriptor system, *Journal of Control Engineering and Applied Informatics*, Vol. 12(2), 2010, pp. 10–16.
- [P13] C. Oară, S. Sabău, Parametrization of  $\Omega$ -stabilizing controllers and closed-loop transfer matrices of a singular system, *Systems and Control Letters*, Vol. 60(2), 2011, pp. 87–92. [Q1/AIS-A&CS]
- [P14] C. Oară, R. Andrei, Computation of the general  $(J, J')$ -lossless factorization, *IEEE Transactions on Automatic Control*, Vol. 56(3), 2011, pp. 710–717. [Q1/AIS-A&CS]
- [P15] M. Jungers, C. Oară, Non-symmetric algebraic Riccati theory: a matrix pencil approach, *European Journal of Control*, Vol. 18(1), 2012, pp. 74–81.
- [P16] C. Oară, R. Andrei, Numerical solution to a descriptor discrete-time algebraic Riccati equation, *Systems and Control Letters*, Vol. 62(2), 2013, pp. 201–208. [Q1/AIS-A&CS]
- [P17] C. Oară, R. Andrei,  $J$ -factorizations of a general discrete-time system, *Automatica*, Vol. 49(7), 2013, pp. 2221–2228. [Q1/AIS-A&CS]
- [P18] F. Tudor, C. Oară,  $H^2$  optimal control for generalized discrete-time systems, *Automatica*, Vol. 50(5), 2014, pp. 1526–1530. [Q1/AIS-A&CS]
- [P19] F. Tudor, C. Oară,  $H^\infty$  control problem for discrete-time algebraic dynamical systems, *SIAM Journal on Control and Optimization*, Vol. 53(5), 2015, pp. 3171–3194. [Q1/AIS-A&CS]
- [P20] C. Oară, C. Flutur, M. Jungers, Squaring down with zeros cancellation in generalized systems, *Systems and Control Letters*, Vol. 92, 2016, pp. 5–12. [Q1/AIS-A&CS]
- [P21] S. Sabau, C. Oară, S. Warnick, A. Jadbabaie, Optimal distributed control for platooning via sparse coprime factorizations, *IEEE Transactions on Automatic Control*, full paper, accepted, scheduled to appear March 2017. [Q1/AIS-A&CS]
- [P22] M. Jungers, C. Oară, Solving nonsymmetric algebraic Riccati equations: A matrix sign function approach, *Mathematics of Control, Signals, and Systems*, accepted 2016. [Q2/AIS-A&CS]

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<sup>1</sup>Q1 and Q2 denotes the top 25% and top 50% journals, respectively, according to Article Influence Score (AIS) or Impact Factor (IF), in the fundamental areas Automation and Control Systems (A&CS), Mathematics (M), or Applied Mathematics (AM).

[P23] F. Tudor, C. Oară, Robust stabilization of generalized systems perturbed on normalized coprime factors, *IEEE Transactions on Automatic Control*, accepted 2016. [Q1/AIS-A&CS]

## Books/Book chapters

[B1] C. Oară, D. Popescu, Ch. 7: Analysis of linear systems, in *Automatica*, Vol. I, (Ed: I. Dumitrache), Editura Academiei Romane, Bucuresti, Romania, ISBN: 978-973-1883-4, 2009, pp. 299–350.

[B2] C. Oară, Ch. 10: Design of state feedback law, in *Automatica*, Vol. I, (Ed: I. Dumitrache), Editura Academiei Romane, Bucuresti, Romania, ISBN: 978-973-1883-4, 2009, pp. 471–502.

[B3] C. Oară, M. Olteanu, R. Stefan, Ch 11: Mathematical theory of systems, in *Enciclopedie Matematica*, (Ed: M. Iosifescu, O. Stanasila, D. Stefanoiu), Ed. AGIR, Bucuresti, Romania, ISBN: 9789737202888, 2010, pp. 690-766.

[B4] C. Oară, Ch. 20: Analysis of MIMO systems, in *Automatica*, Vol. II, (Ed: I. Dumitrache, T. Dragomir), Editura Academiei Romane, Bucuresti, Romania, ISBN: 978-973-27-2298-5, 2013, pp. 115–161.

[B5] C. Oară, Ch. 21: Synthesis of MIMO systems, in *Automatica*, Vol. II, (Ed: I. Dumitrache, T. Dragomir), Editura Academiei Romane, Bucuresti, Romania, ISBN: 978-973-27-2298-5, 2013, pp. 162–217.

[B6] C. Oară, Ch. 22: Robust systems, in *Automatica*, Vol. II, (Ed: I. Dumitrache, T. Dragomir), Editura Academiei Romane, Bucuresti, Romania, ISBN: 978-973-27-2298-5, 2013, pp. 218–318.

[B7] F. Stoican, C. Oară, M. Hovd, RPI approximations of the mRPI set characterizing linear dynamics with zonotopic disturbances, in *Developments in Model-Based Optimization and Control* (ed. S. Oлару, A. Grancharova, F. Lobo Pereira), Lecture Notes in Control and Information Science, Springer, 2016, ISBN 978-3-319-26687-9, pp. 361–377.

## International Conference Papers (in Proceedings)

[C1] C. Oară, A QR factorization of a rational matrix : the class of solutions and applications in systems theory, *Proc. Mathematical Theory of Network and Systems*, MTNS 2000, Perpignan, 19–23 June, 2000.

[C2] C. Oară, On computing normalized coprime factorization of arbitrary rational matrices, *Proc. American Control Conference*, ACC 2000, Chicago, 28–30 June, 2000, Session TA 18-1.

[C3] C. Oară, Results on Contractive Descriptor Systems, *Proc. American Control Conference*, ACC 2001, June, 2001.

[C4] C. Oară, General Spectral Factorization with Respect to the Disk, *Proc. American Control Conference*, ACC 2001, June, 2001.

[C5] C. Oară, R. Stefan, P. Van Dooren, Maximizing the Stability Radius: A LMI Approach, *Proc. American Control Conference*, ACC 2001, June, 2001.

[C6] V. Ionescu, C. Oară, Singular H-infty Control in Terms of Nonstandard J-Spectral Factorizations, *Proc. European Control Conference*, ECC2001, August 2001.

[C7] C. Oară, Singular H-infty Control in Terms of Nonstandard J-Spectral Factorizations, *Proc. American Control Conference*, ACC2002, May 2002, Anchorage, Alaska.

[C8] C. Oară, R. Stefan, Generalized Riccati theory: from factorizations to equations and back, part I, *Proc. Mathematical Theory of Network and Systems*, Leuven, Belgium, July 5-9, 2004.

[C9] C. Oară, R. Stefan, Generalized Riccati theory: from factorizations to equations and back, part II, *Proc. Mathematical Theory of Network and Systems*, Leuven, Belgium, July 5-9, 2004.

[C10] C. Oară, R. Stefan, Constructive solutions to general (J,J)lossless factorization with respect to the disk, *Proc. Mathematical Theory of Network and Systems*, Leuven, Belgium, July 5-9, 2004.

[C11] C. Oară, Zero cancellation: constructive solutions and numerical algorithms, *Proc. Mathematical Theory of Network and Systems*, Blacksburg, Virginia, 28 July-1 August, 2008.

[C12] C. Oară, S. Sabau, Squaring down descriptor systems, *Proc. Mathematical Theory of Network and Systems*, Blacksburg, Virginia, 28 July-1 August, 2008.

[C13] M. Jungers, H. Abou-Kandil, C. Oară, R. Stefan, Open loop Stackelberg strategy for linear quadratic games via matrix pencil approach, *IFAC Workshop on Control Applications of Optimisation*, 6-8 May, 2009, Agora, Finland.

[C14] M. Jungers, H. Abou-Kandil, C. Oară, R. Stefan, Open loop Nash strategy for linear quadratic games via matrix pencil approach, *Proc. European Control Conference*, 2009, Budapest, august 2009.

[C15] M. Jungers, C. Oară, Non-symmetric algebraic Riccati theory: A matrix pencil approach, *Conference on Decision and Control*, Shanghai, China 16-18 Decembrie, 2009.

- [C16] C. Oară, S. Sabau, The class of doubly coprime factorizations, Omega-stabilizing controllers, and achievable closed-loop transfer functions of a general descriptor system, *Proc. American Control Conference*, 2010, Baltimore, SUA.
- [C17] C. Oară, R. Andrei, Constructive solutions to J-lossless conjugation, (J,J')-spectral and (J,J')-lossless factorizations of a general system, *Proc. American Control Conference*, 2010, Baltimore, SUA.
- [C18] C. Oară, R. Andrei, The descriptor discretetime Riccati equation: numerical solution and applications, *Proc. Mathematical Theory of Networks and Systems*, Melbourne, Australia, July 9-13, 2012.
- [C19] C. Oară, R. Marinica, The general (J,J) lossless factorization for descriptor discrete-time systems, Proc. Conference on Decision and Control, Maui, Hawaii, December 10-13, 2012.
- [C20] S. Sabau, C. Oară, S. Warnick, A. Jadbabaie, Structured coprime factorizations description of linear timeinvariant networks, *Proc. Conference on Decision and Control*, Florence, Italy, 10-13 December 2013.
- [C21] F. Tudor, C. Oară, H2 optimal output feedback control for a general discrete-time system, *European Control Conference*, June 24-27, 2014.
- [C22] C. Lupu, D. Oancea, C. Oară, M. Lupu, D. Apetrei, Real time approach for load balancing in virtual power plant structure, *18-th International Conference on System Theory, Control and Computing*, Sinaia, Romania, October, 17-19, 2014.
- [C23] C. Dinicu, C. Oară, On computing the L-2 norm of a generalised discrete-time system, *18-th International Conference on System Theory, Control and Computing*, Sinaia, Romania, October, 17-19, 2014. 0
- [C24] C. Flutur, C. Oară, Minimal factorization for transfer matrices of generalized systems, *18-th International Conference on System Theory, Control and Computing*, Sinaia, Romania, October, 17-19, 2014.
- [C25] F. Tudor, C. Oară, H-infinity control problem for general discrete-time systems, *Proc. American Control Conference*, Chicago, July 1-3, 2015.
- [C26] D. Claudiu, C. Oară, The descriptor continuous-time algebraic Riccati equation: numerical solutions and some direct applications, *Proc. European Control Conference*, Linz, Austria, 2015.
- [C27] C. Flutur, C. Oara, Simultaneous squaring down and zeros cancellation in linear systems, *Proc. 20th International Conference on Control Systems and Computer Science*, 27-29 May, 2015.
- [C28] F. Tudor, C. Oara, A Moebius transformation for algebraic dynamical systems, *Proc. 20th International Conference on Control Systems and Computer Science*, Bucharest, Romania, 27-29 May, 2015.
- [C29] F. Stoican, E. Grotli, I. Prodan, C. Oara, On corner cutting in multi-obstacle avoidance problems, *5th IFAC Conference on Nonlinear Model Predictive Control*, Seville, Spain, 2015.
- [C30] S. Sabau, C. Oara, S. Warnick, A. Jadbabaie, Optimal distributed control for platooning via sparse coprime factorizations, *Proc. American Control Conference*, Boston, USA, 6-8 July, 2016.

## Research Grants

- [G1] Robust Control Approach in Systems Theory, 2000-2001, grant BM tip C, 60 000 USD;
- [G2] Numerical Linear Algebra Techniques for Optimization and Control of Systems, 2000-2002, grant BM tip T, 40 000 USD;
- [G3] Matrix Pencils and Noncanonical Factorizations with Applications in Control Systems, 2007-2010, grant PCE Idei, 900 000 lei;
- [G4] Robust Control in Nonstandard Cases, 2011-2016, grant PCE Idei, 1 440 000 lei.