

Ignat DOMANOV

voluntary worker

KU Leuven Campus Kortrijk

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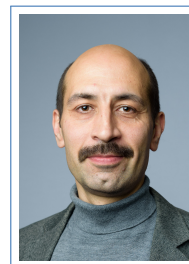
🌐 www.domanovi.com

📅 Date of birth: 17 July 1976

🇧🇪🇺🇦 Citizenship: Belgian & Ukrainian

👪 Marital status: married, three children

🏠 Home address: Pottelberg 89, Kortrijk



About

Experienced Postdoctoral Researcher, PhD in Engineering (KU Leuven, 2013), PhD in Pure Math (Ukraine, 2004), 20+ publications in refereed journals (including IEEE and SIAM journals)

My second PhD thesis and subsequent 7 years of a PostDoc position were mainly devoted to the canonical polyadic, multilinear singular value, and block term tensor decompositions – mathematical concepts that have found many applications in various applied fields like Chemometrics, Psychometrics, Food Industry, Bio-engineering, and Telecommunication. The tools I used in my research are (numerical) linear algebra (most of the papers), graph theory [2], and optimization [3, 9]. Papers [5, 8] illustrate some applications of tensor decompositions and algebraic geometry in array processing and blind source separation.

Some matlab code that relates to my research can be found at

<https://gitlab.esat.kuleuven.be/tensorgroup-public/domanov-code>

Degrees

19 Sep 2013 **PhD in Engineering**, *KU Leuven*, Belgium, (promoter L. De Lathauwer).

9 June 2004 **Candidate of Sciences in Mathematics and Physics (Mathematical Analysis)**, *IAMM*, Ukraine, (promoter M. Malamud).

30 June 1998 **Master in Mathematics, Diploma with Honor**, *Donetsk State University*, Ukraine.

Career and studies

8 Apr 2021 **dot Net ontwikkelaar C#**, *VDAB*, Belgium.

present [ASP.NET MVC](#), [Entity Framework](#), [Web API](#), [WPF](#)

2 Feb 2021 **Basisopleiding ICT ontwikkeling**, *VDAB*, Belgium.

7 Apr 2021 [Javascript](#), [HTML](#), [CSS](#), [MySQL](#)

1 Oct 2020 **voluntary worker (vrijwillig medewerker)**, *KU Leuven*, Belgium.

present

1 Oct 2013 **Postdoctoral researcher**, *KU Leuven*, Belgium.

30 Sept 2020

1 Oct 2008 **Pre-doctoral and doctoral student**, *KU Leuven*, Belgium.

30 Sept 2013

1 Sept 2007 **Junior Researcher**, *Institute of Applied Mathematics and Mechanics of NAS of*

30 Sept 2008 *Ukraine*, Ukraine.

- 1 Oct 2006 **Visiting scientist**, *Institute of Mathematics of the Academy of Sciences of the Czech Republic*, Czech Republic.
 31 Aug 2007
- 1 Aug 2003 **Engineer, Senior Engineer, Junior Researcher**, *Institute of Applied Mathematics and Mechanics of NAS of Ukraine*, Ukraine.
 30 Sept 2006

Coursera Certificates

- Deep Learning Deep Learning, a 5-course specialization by deeplearning.ai on Coursera. Specialization Certificate earned on 12 Oct 2018
- Python Python for Everybody, a 5-course specialization by University of Michigan on Coursera. Specialization Certificate earned on 21 Feb 2017
- Machine Learning Machine Learning by Stanford University on Coursera. Certificate earned on 23 Oct 2016

Teaching Experience

- 1 Apr 2009 **Teaching assistant (assigned teaching duties)**, *KU Leuven, Campus Kortrijk*, Belgium, (Systems theory, X0B92A).
 30 Sept 2020
- 1 Sept 2004 **Assistant professor(part time, 1/4)**, *Department of Mathematical Analysis and Function Theory, Donetsk National University*, Ukraine, (Course on functional analysis and measure theory for applied mathematicians).
 30 June 2005
- 1 Sept 2002 **Teaching assistant (full time)**, *Department of Higher and Applied Mathematics, Donetsk National University of Economics and Trade named after M. I. Tugan-Baranovsky*, Ukraine, (Elements of higher mathematics).
 31 July 2003
- 2000–2003 **School teacher (part time)**, *General Educational Specialized Sanatorium Boarding Establishment for Talented Children "Erudite"*, Donetsk, Ukraine, (Course on Geometry).

Awards and Grants

- 2013 PostDoc grant PDM-Kort, KU Leuven (1 year)
- 2008 Scholarship of the President of Ukraine (1 year)
- 2005 Grant of the National Academy of Sciences of Ukraine 0105U006289 :“The investigation of some properties of integral and differential operators with applications to the general theory of boundary problems” (research group leader, 1 year)
- 2004 Scholarship of the National Academy of Sciences of Ukraine for young scientists (1 year)
- Oct 2004 The Queen Jadwiga Fund Scholarship (Krakow, Poland) (1 month)
- 2004 Premium in honor of Ya.B. Lopatinskii (IAMM, Ukraine)
- 2004 The Diploma and Premium of the National Academy of Sciences of Ukraine for young scientists
- 1999 The Scholarship of the Donetsk region Council for talented pupils, students, and postgraduate students of the Donetsk region (1 year)
- 1998 The Diploma and Premium of the National Academy of Sciences of Ukraine for students

- 1998 The diploma of the first degree at the Ukrainian competition of the students scientific works (the competition was held by the Odessa State University)
- 1996 First prize at student's mathematical olympiad, Donetsk State University
- 1994 Soros Foundation Fellowship grant N GSU051048

Service

- 2001–2020 Reviewer for Mathematical Reviews *(50+ reviews written)*
- 2014–2020 Reviewer for Math-Zentralblatt
- 2006–2020 **Referee for** IEEE Transactions on Signal Processing, IEEE Journal of Selected Topics in Signal Processing, IEEE Signal Processing Letters, SIAM Journal on Matrix Analysis and Applications, Linear and Multilinear Algebra, Linear Algebra and its Applications, Studia Mathematica, Integral Equations and Operator Theory, Mathematische Nachrichten

Languages

- Ukrainian Native language
- Russian Native language
- English Fluent
- Dutch Niveau 4 (2.2)

Talks and posters presented at conferences and seminars

- 2019 International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, July 15–19, 2019 (talk)
- 2018 SIAM Annual Meeting (SIAM AN18), Portland, Oregon, USA, July 9–13, 2018 (talk)
- 2017 SIAM Conference on Applied Algebraic Geometry, (AG17), Atlanta, Georgia, USA, July 31–August 4, 2017 (talk)
- 2017 Householder Symposium XX on Numerical Linear Algebra, The Inn at Virginia Tech, Blacksburg, VA, USA, June 18–23, 2017 (poster)
- 2016 20th Conference of the International Linear Algebra Society (ILAS 2016), Leuven, Belgium, July 11–15, 2016 (talk)
- 2016 Workshop on Tensor Decompositions and Applications, (TDA 2016), Leuven, Belgium, January 18–22, 2016 (talk and poster)
- 2015 SIAM Conference on Applied Algebraic Geometry, (AG15), Daejeon, Korea, August 3–7, 2015 (talk)
- 2015 Winter School “Search for Latent Variables: ICA, Tensors, and NMF”, Villard de Lans, France, February 2–4, 2015 (talk)
- 2014 Summer School on “An Interdisciplinary Approach to Tensor Decompositions”, Trento, Italy, July 14–18, 2014 (talk)
- 2012 The 7th edition of the multidisciplinary conference on ThRee-way methods In Chemistry And Psychology (and other areas) (TRICAP-2012), Bruges, Belgium, June 2–7, 2012 (talk)

- 2011 The 19th European Signal Processing Conference (EUSIPCO 2011), Barcelona, Spain, August 29–September 2, 2011 (poster)
- 2011 The 17th Conference of the International Linear Algebra Society (ILAS), Braunschweig, Germany, August 22–26, 2011 (talk)
- 2010 Workshop on Tensor Decompositions and Applications (TDA 2010), Monopoli, Bari, Italy, September 13–17, 2010 (talk)
- 2010 The 16th Conference of the International Linear Algebra Society (ILAS), Pisa, Italy, June 21–25, 2010 (2 talks)
- 2010 The 19th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2010), Budapest, Hungary, July 5–9, 2010 (talk)
- 2010 29th Benelux Meeting on Systems and Control(Heeze, The Netherlands, March 30–April 1, 2010) (talk)
- 2008 Dynamical systems control and optimization (DYSCO), Study Day, November 27, 2008 (poster)
- 2006 Talk on the Seminar on Partial Differential Equations of Institute of Mathematics of the Academy of Sciences of the Czech Republic, "On the spectrum of the Volterra composition operator", November 28, 2006
- 2006 Talk on the Seminar on Functional Analysis of Institute of Mathematics of the Academy of Sciences of the Czech Republic, "On the spectrum and eigenfunctions of some Volterra type operators", November 7, 2006
- 2006 The 21st Conference on Operator Theory, Timisoara, Romania, June 29–July 4, 2006 (talk: On the spectrum of the operator being the composition of integration and substitution)
- 2005 The 16th Crimean Autumn Mathematical School-Symposium, Laspi-Batiliman, Ukraine, September 17–29, 2005 (talk)
- 2000, 2001 The 22nd and 23rd conferences of young scientists of mec.-math. department of Moscow State University, Moscow, Russia, 2000, 2001 (talks)
- 2000 Functional analysis Valencia 2000, A Satellite Conference to the Third European Congress of Mathematics in Barcelona, Valencia, Spain, July 3–7, 2000 (talk)

Publications

Refereed journal publications

- [1] J. Vanderstukken, P. Kurschner, I. Domanov, L. De Lathauwer, Systems of polynomial equations, higher-order tensor decompositions and multidimensional harmonic retrieval: A unifying framework. Part II: The block-term decomposition, *SIAM J. Matrix Anal. Appl.*, 42(2):913–953, 2021.
- [2] I. Domanov, L. De Lathauwer, From computation to comparison of tensor decompositions, *SIAM J. Matrix Anal. Appl.*, 42(2):449–474, 2021.
- [3] I. Domanov, L. De Lathauwer, On uniqueness and computation of the decomposition of a tensor into multilinear rank- $(1, L_r, L_r)$ terms, *SIAM J. Matrix Anal. Appl.*, 41(2):747–803, 2020.

- [4] M. Boussé M., N. Vervliet, I. Domanov, O. Debals, L. De Lathauwer, Linear Systems with a Canonical Polyadic Decomposition Constrained Solution: Algorithms and Applications, *Numer Linear Algebra Appl.*, 25:e2190, <https://doi.org/10.1002/nla.2190>, 2018.
- [5] M. Sørensen, I. Domanov, L. De Lathauwer, Coupled canonical polyadic decompositions and multiple shift-invariance in array processing, *IEEE Transactions on Signal Processing*, 66(14):3665–3680, 2018.
- [6] I. Domanov, A. Stegeman, and L. De Lathauwer, On the largest multilinear singular values of higher-order tensors, *SIAM J. Matrix Anal. Appl.*, 38(4):1434–1453, 2017.
- [7] I. Domanov, L. De Lathauwer, Canonical polyadic decomposition of third-order tensors: relaxed uniqueness conditions and algebraic algorithm. *Linear Algebra Appl.*, 513, 342–375, 2017.
- [8] I. Domanov, L. De Lathauwer, Generic uniqueness of a structured matrix factorization and applications in blind source separation. *IEEE Journal of Selected Topics in Signal Processing*, 10(4):701–711, 2016.
- [9] L. Sorber, I. Domanov, M. Van Barel, and L. De Lathauwer. Exact line and plane search for tensor optimization. *Computational Optimization and Applications*, 63(1):121–142, 2016.
- [10] I. Domanov, L. De Lathauwer, Generic uniqueness conditions for the canonical polyadic decomposition and INDSCAL. *SIAM J. Matrix Anal. Appl.*, 36(4):1567–1589, 2015.
- [11] M. Sørensen, I. Domanov, L. De Lathauwer. Coupled Canonical Polyadic Decompositions and (Coupled) Decompositions in Multilinear rank- $(L_{r,n}, L_{r,n}, 1)$ terms — Part II: Algorithms. *SIAM J. Matrix Anal. Appl.*, 36(3):1015–1045, 2015.
- [12] I. Domanov, L. De Lathauwer. Canonical polyadic decomposition of third-order tensors: reduction to generalized eigenvalue decomposition. *SIAM J. Matrix Anal. Appl.*, 35(2):636–660, 2014.
- [13] I. Domanov, L. De Lathauwer. On the uniqueness of the canonical polyadic decomposition of third-order tensors — Part I: Basic results and uniqueness of one factor matrix. *SIAM J. Matrix Anal. Appl.*, 34(3):855–875, 2013.
- [14] I. Domanov, L. De Lathauwer. On the uniqueness of the canonical polyadic decomposition of third-order tensors — Part II: Overall uniqueness. *SIAM J. Matrix Anal. Appl.*, 34(3):876–903, 2013.
- [15] I. Domanov. On invariant subspaces of matrices: A new proof of a theorem of Halmos. *Linear Algebra Appl.*, 433(11-12):2255–2256, 2010.
- [16] I. Domanov, M. M. Malamud. On the Spectral Analysis of Direct Sums of Riemann-Liouville Operators in Sobolev Spaces of Vector Functions. *Integral Equations and Operator Theory*, 63(2):181–215, 2009.

- [17] I. Domanov. On the spectrum of the operator which is a composition of integration and substitution. *Studia Mathematica*, 185(1):49–65, 2008.
- [18] I. Domanov. On the spectrum and eigenfunctions of the operator $(Vf)(x) = \int_0^{x^\alpha} f(t)dt$. *Banach Center Publ.*, 75:137–142, 2007.
- [19] I. Domanov. On cyclic subspaces and the unicellularity of the operator $(V_{q,w}f)(x) = q(x) \int_0^x f(t)w(t)dt$. *Ukrainian Mathematical Bulletin*, 2:177–219, 2004.
- [20] I. Domanov, V. V. Surovtseva. On the reflexivity of the operator $J_k^\alpha \oplus J_{k+s}^\alpha$. *Reports of the National Academy of Sciences of Ukraine (Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki)*, 9:26–30, 2004.
- [21] I. Domanov. Spectral Analysis of Powers of the Operator $(V_{q,w}f)(x) = q(x) \int_0^x f(t)w(t)dt$, *Math. Notes*, 73(3-4):408–413, 2003.
- [22] I. Domanov. On Cyclic Subspaces of the Operator $(V_{q,w}f)(x) = q(x) \int_0^x f(t)w(t)dt$. *Russian Math. Surveys*, 58(1):177–179, 2003.
- [23] I. Domanov, M. M. Malamud. Invariant and hyperinvariant subspaces of an operator J^α and related operator algebras in sobolev spaces. *Linear Algebra Appl.*, 348(1–3):209–230, 2002.
- [24] I. Domanov. On the Spectral Multiplicity of Some Volterra Operators in Sobolev Spaces. *Math. Notes*, 72(1-2):275–280, 2002.
- [25] I. Domanov, M. M. Malamud. On the lattices of Invariant Subspaces and Hyperinvariant Subspaces of the Operator $J^\alpha \otimes B$ in the Sobolev spaces. *Math. Notes*, 70(3-4):508–514, 2001.
- [26] I. Domanov, M. M. Malamud. Invariant subspaces and hyperinvariant subspaces of an operator J^α defined on Sobolev spaces. *Reports of the National Academy of Sciences of Ukraine (Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki)*, 7:37–42, 2001.
- [27] I. Domanov. On Cyclic and Invariant Subspaces of the Operator $J \otimes B$ in the Sobolev spaces of vector functions. *Methods of Functional Analysis and Topology*, 5(1):1–12, 1999.
- [28] I. Domanov. On Cyclic and Invariant Subspaces of the Operator $J \otimes B$ in the Sobolev spaces. *Reports of the National Academy of Sciences of Ukraine (Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki)*, 5:20–25, 1999.

Publications in proceedings

- [PP1] I. Domanov, L. De Lathauwer. Enhanced Line Search for Blind Channel Identification Based on the Parafac Decomposition of Cumulant Tensors, in *Proc. of the 19th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2010)*, Budapest, Hungary, Jul. 2010, pp. 1001–1002.
- [PP2] I. Domanov, L. De Lathauwer. Blind Channel Identification of MISO Systems Based on the CP Decomposition of Cumulant Tensors, in *Proc. of the 2011 European*

Signal Processing Conference (EUSIPCO 2011), Barcelona, Spain, Aug.-Sep. 2011, pp. 2215–2218.