

CV of Prof. Dr. Dmitry A. Zaitsev



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Education:

1981-1986 Donetsk Polytechnic Institute (DPI), Applied Mathematics, Ms.

1988-1991 post graduate course, DPI, Computer Science

1991 Academic Council of Kiev Cybernetics Institute Ac.Sci. Ukraine, Ph.D., Automated Control

2006 Academic Council of Odessa National Academy of Telecommunications (ONAT), Dr.Sci., Telecommunication Systems and Networks

Training courses:

1986 System Programmer of RSX11M (DEC), LIMTU, St.Petersburg

1994 Organisation of Business in HiTech, RPI (USA) in Kiev

1995 Internet and Web Technology, DEC in Apatity, Russia

2002 Administration of Modern OS and DBMS, DIIT, Dnepropetrovsk, Ukraine

Jobs:

1986-1996 DPI, Department of Applied Mathematics and Informatics (AMI): 1986-1992 assistant professor, 1992-1996 associate professor; chief programmer in software development projects; system programmer; computer network administrator

1997-1998 Surgut State University, Department of Computer Science and Informatics, associate professor; chief of Network Technology Laboratory

1999-2003 Information and Computer Centre of Odessa Railway, leader engineer

2002-2006 ONAT, Department of Communication Networks, associate professor

2006-2009 Professor

March 2005 University Paris-Dauphine, invite professor

2009-2019 International Humanitarian University, Department of Computer Engineering, professor

2014-2019 Vistula University, Warsaw, Department of Computer Science, professor

July-August 2015 Technical University of Dortmund, visiting professor, DAAD fellowship

Autumn 2017 Innovative Computing Laboratory, University of Tennessee, USA, Visiting Professor (Fulbright Scholarship)

July 2018 Eindhoven University of Technology, Netherlands, Visiting Professor

January 2019 Barcelona Supercomputing Center, Visiting Professor (Erasmus+ Scholarship)
2019- Odessa State Environmental University, department of Information Technology, professor

Principal Theoretical Results:

Clans of systems of linear algebraic equations, their simultaneous and parallel-sequential composition
Explicit construction of Universal Sleptsov/Petri Nets
Analysis of Infinite Petri Nets with regular structure (linear, square, hypercube)
Generalized neighbourhood for cellular automata
Compositional Analysis of Petri Nets based on Decomposition of Petri Net into Functional Subnets
Functional equivalence and equivalent transformations of timed Petri nets
Timed Petri nets with multi-channel transitions, their state equation and partial invariants
Synthesis of Continuous (fuzzy) Logic function given by table

Principal Scientific-Practical Results:

Software systems: Opera-Topaz – Petri net based production control and management, Nevod – Petri net modeling system for embedded applications, Sergio – editor of electrical circuits
Plug-in modules for Petri net modelling system Tina: Deborah – decomposition into clans, Adriana and ParAd – compositional computing Petri net invariants
Petri net models of networking protocols: TCP, BGP, IOTP, ECMA
Software generators of Petri net models of grids: square, hypercube, hypertorus
Colored Petri net models of networks: Ethernet, IP, MPLS, Bluetooth, PBB, E6
Stack of networking protocols E6 and its implementation in Linux kernel

Invited presentations:

Erasmus+ talk at Barcelona Supercomputing Center: "Speed-up Solving Linear Systems via Composition of Clans", January 31, 2019.

Webinar "Sleptsov Net Computing: The Solution to Hyper-Computations Supporting Cybersecurity and Other Applications", IGI-Global, USA, March 28, 2018.

Invited lecture at New Jersey Institute of Technology, Newark, USA - "Infinite Petri Nets", 11 October, 2017.

Invited lecture at Stony Brook University, New York, USA - "Sleptsov Net Computing", 11 October, 2017.

Zaitsev D.A. Sleptsov Net Computing. An invited talk to 8th Workshop Program Semantics, Specification and Verification: Theory and Applications (PSSV'2017), June 26, 2017, Moscow State University, Russia.

Zaitsev D.A. Universal Petri and Sleptsov Nets. A keynote talk to 15th Annual Industrial Simulation Conference (ISC'2017), May 31-June 2, 2017, Polish Academy of Sciences, Warsaw, Poland.

Zaitsev D.A. Sleptsov Net Computing. A keynote talk to 2nd International Symposium on Emerging Topics in Computing and Communications (SETCAC'16), 21-24 September 2016, Jaipur, India.

Organisation of International conferences and reviewing of journals:

Program Chair of: 2nd International Symposium on Emerging Topics in Computing and Communications (SETCAC'16), 21-24 September 2016, Jaipur, India.

PC member of: IEEE International Conference on INnovations in Intelligent Systems and Applications (INISTA'2017), Gdynia, Poland, 3-5 July 2017; 21st International Conference on Knowledge Based and Intelligent Information and Engineering Systems, KES-2017, Marceille,

France; IEEE Problems of Infocommunications. Science and Technology, PICS&T-2018, Kharkiv, Ukraine.

Reviewer of: AMS Mathematical Reviews; Information Sciences; Fundamenta Informatica; Peer-to-Peer Networking and Applications; Journal of Automata, Languages, and Combinatorics; Evolving Systems; IEEE Access; IEEE Transactions on Systems, Man and Cybernetics: Systems; IEEE Transactions on Cybernetics; IMA Journal of Mathematical Control and Information.

Participation in industrial innovation:

1988-1991 Donetsk plant Topaz. Introduction of Opera-Topaz - a system of operative planning and management on the base of Petri net models.

1991 Sergovska power substation. Introduction of Sergo - an editor of electric circuits of the power substations.

1992 Minsk Woodprocessing Plant. Introduction of Nevod - a system of modelling of processes and decision making on the base of Petri net models.

1992 Motorsich Corporation, Zaporizhzhе. Introduction of Opera-Topaz.

Prizes and Awards:

Senior member of the IEEE - 2011

Senior member of the ACM - 2015

DAAD fellowship - 2015

Fulbright Scholarship - 2017-2018

Funding received:

"Solving linear Diophantine systems via composition of their clans" - Fullbright scholarship, 2017

"Security of model-driven software development" - DAAD fellowship, 2015

"Analysis of computational grids efficiency via Colored Petri Nets" - Austria-Ukraine cooperation grant, 2013-2014

"Production control with Petri nets" - China-Ukraine cooperation grant, 2011-2012

"Developing New Addressing Systems for World-Wide Networks (E6)" - Ukraine state grant, 2008-2009

"Verification of Complex Networking Protocols" - grant NATO ICS.NUKR.CLG 982698, 2007-2008

"Simulating Backbone MPLS Networks" - Ukrtelekom corporation, 2007-2008

Supervising and mentoring activities:

2 Ph.D. students

28 Ms. students

12 Bc. students

Publications:

Monographs

Zaitsev D.A. Clans of Petri Nets: Verification of protocols and performance evaluation of networks, LAP LAMBERT Academic Publishing, 2013, 292 p.

Book chapters

Zaitsev D.A. and Shmeleva T.R. Modeling With Colored Petri Nets: Specification, Verification, and Performance Evaluation of Systems (pp. 378-404) Chapter 14 in T. Shmelova, N. Rizun, D. Kucherov and K. Dergachov (Ed.) Automated Systems in the Aviation and Aerospace Industries. IGI-Global: USA, 2019.

Zaitsev D.A. Sleptsov Net Computing (pp. 7731-7743) Chapter 672 in Mehdi Khosrow-Pour (Ed.) Encyclopedia of Information Science and Technology, Fourth Edition (10 Volumes). IGI-Global: USA, 2017.

Zaitsev D.A., Zaitsev I.D., Shmeleva T.R. Infinite Petri Nets as Models of Grids (pp. 187-204). Chapter 19 in Mehdi Khosrow-Pour (Ed.) Encyclopedia of Information Science and Technology, Third Edition (10 Volumes). IGI-Global: USA, 2014.

Zaitsev D.A. Composition of Functional Petri Nets (pp. 404-465). Chapter 17 in Z.W. Li and A.M. Al-Ahmari (Ed.), Formal Methods in Manufacturing Systems: Recent Advances. IGI-Global: USA, 2013.

Issues listed in JCR (and indexed in WoS and Scopus)

Dmitry Zaitsev, Stanimire Tomov, Jack Dongarra. Solving Linear Diophantine Systems on Parallel Architectures, IEEE Transactions on Parallel and Distributed Systems, 30(5), 2019, 1158-1169. DOI: 10.1109/TPDS.2018.2873354 (*Journal Impact Factor: 3.971*)

Zaitsev D.A. Simulating Cellular Automata by Infinite Petri Nets, Journal of Cellular Automata. 13(1-2), 2018, 121-144. (*Journal Impact Factor: 0.511*)

D.A. Zaitsev, Z.W. Li. On simulating Turing machines with inhibitor Petri nets, IEEJ Transactions on Electrical and Electronic Engineering, 13(1), 2018, 147-156. Online 23 August 2017, DOI: 10.1002/tee.22508 (*Journal Impact Factor: 0.723*)

Zaitsev D.A. Universal Sleptsov Net, International Journal of Computer Mathematics, 94(12) 2017, 2396-2408. Online 20 Jan 2017, DOI: 10.1080/00207160.2017.1283410 (*Journal Impact Factor: 1.054*)

Zaitsev D.A. A generalized neighborhood for cellular automata, Theoretical Computer Science, 666 (2017), 21-35, DOI: 10.1016/j.tcs.2016.11.002 (*Journal Impact Factor: 0.772*)

D. A. Zaitsev , T. R. Shmeleva, W. Retschitzegger, B. Pröll Security of grid structures under disguised traffic attacks, Cluster Computing, 19(3) 2016, 1183-1200. Online 17 June 2016. DOI: 10.1007/s10586-016-0582-9 (*Journal Impact Factor: 1.601*)

Zaitsev D.A., Jürjens J. Programming in the Sleptsov net language for systems control, Advances in Mechanical Engineering, 2016, Vol. 8(4), 1-11. DOI: 10.1177/1687814016640159 (*Journal Impact Factor: 0.848*)

Zaitsev D.A. Sequential composition of linear systems' clans, Information Sciences, Vol. 363, 2016, 292-307. DOI: 10.1016/j.ins.2016.02.016 (*Journal Impact Factor: 4.305*)

Zaitsev D.A. Sleptsov Nets Run Fast, IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2016, Vol. 46, No. 5, 682 - 693. DOI: 10.1109/TSMC.2015.2444414 (*Journal Impact Factor: 5.131*)

Zaitsev D.A. Paradigm of Computations on the Petri Nets, Automation and Remote Control, 2014, Vol. 75, No. 8, 1369-1383, DOI: 10.1134/S0005117914080025 (*Journal Impact Factor: 0.562*)

Zaitsev D.A. Toward the Minimal Universal Petri Net, IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2014, Vol. 44, No. 1, 47-58, epub: 15 February 2013, DOI: 10.1109/TSMC.2012.2237549 (*Journal Impact Factor: 5.131*)

Zaitsev D.A. Switched LAN simulation by colored Petri nets, Mathematics and Computers in Simulation, Volume 65, Issue 3, 22 April 2004, 245-249, DOI: 10.1016/j.matcom.2003.12.004 (*Journal Impact Factor: 1.476*)

Issues indexed in WoS and Scopus

Dmitry Zaitsev, Stanimire Tomov, Jack Dongarra. Solving Linear Diophantine Systems on Parallel Architectures, IEEE Transactions on Parallel and Distributed Systems, 30(5), 2019, 1158-1169. DOI: 10.1109/TPDS.2018.2873354

Dmitry A. Zaitsev, Tatiana R. Shmeleva, Anatoly I. Sleptsov: Reenterable Colored Petri Net Models of Networks, Grids, and Clouds: Case Study for Provider Backbone Bridge. 26th Telecommunications Forum (TELFOR 2018), November 20-21, 2018, Belgrade, Serbia - Invited paper

Dmitry A. Zaitsev, Ivan D. Zaitsev and Tatiana R. Shmeleva. Infinite Petri Nets: Part 2, Modeling Triangular, Hexagonal, Hypercube and Hypertorus Structures, Complex Systems, 26(4), 2017, 341-371. DOI: 10.25088/ComplexSystems.26.2.341

Dmitry A. Zaitsev, Ivan D. Zaitsev and Tatiana R. Shmeleva. Infinite Petri Nets: Part 1, Modeling Square Grid Structures, Complex Systems, 26(2), 2017, 157-195. DOI: 10.25088/ComplexSystems.26.2.157

Zaitsev D.A. A Toolbox for Fuzzy Logic Functions Synthesis on a Choice Table, Eurosis: 15th Industrial Simulation Conference, May 31 – June 1, 2017, Polish Academy of Science, Warsaw, pp. 11-16.

Zaitsev D.A. Universality in Infinite Petri Nets. Proceedings of 7th International Conference, MCU 2015, Famagusta, North Cyprus, September 9-11, 2015, Lecture Notes in Computer Science, Volume 9288, pp 180-197.

Zaitsev D.A., Shmeleva T.R., Retschitzegger W. and Proll B. Blocking Communication Grid via Ill-Intentioned Traffic, 14th Middle Eastern Simulation & Modelling Multiconference, February 3-5, 2014, Muscat, Oman, pp.63-71.

Zaitsev D.A. Verification of Computing Grids with Special Edge Conditions by Infinite Petri Nets, Automatic Control and Computer Sciences, 2013, Vol. 47, No. 7, pp. 403–412. DOI: 10.3103/S0146411613070262

Zaitsev D.A. Inhibitor Petri Net Executing an Arbitrary Given Markov Normal Algorithm, Automatic Control and Computer Sciences, 2012, Vol. 46, No. 7, pp. 345–355. DOI: 10.3103/S0146411612070140

Zaitsev D.A. Universal Petri net, Cybernetics and Systems Analysis, Volume 48, Number 4 (2012), 498-511. DOI: 10.1007/s10559-012-9429-4

Zaitsev D.A., Shmeleva T.R. Verification of hypercube communication structures via parametric Petri nets, Cybernetics and Systems Analysis, Volume 46, Number 1 (2010), 105-114, DOI: 10.1007/s10559-010-9189-y

Zaitsev D.A., Shmeleva T.R. Parametric Petri Net Model for Ethernet Performance and Qos Evaluation , Proc. of 16th Workshop on Algorithms and Tools for Petri Nets, September 25-26, 2009, University of Karlsruhe, Germany, p. 15-28.

Shmeleva, T.R., Zaitsev, D.A., Zaitsev, I.D. Verification of square communication grid protocols via infinite Petri nets, MESM 2009 - 10th Middle Eastern Simulation Multiconference, September 27-29, Beirut, Lebanon, p. 53-59.

Zaitsev D.A., Sakun A.L. An Evaluation of MPLS Efficacy using Colored Petri Net Models , Proc. of of International Middle Eastern Multiconference on Simulation and Modelling (MESM'2008), Amman (Jordan), August 26-28, 2008, p. 31-36.

Zaitsev D.A., Zaitsev I.D. Verification of Ethernet protocols via parametric composition of Petri net , INCOM'2006: 12th IFAC/IFIP/IFORS/IEEE/IMS Symposium Information Control Problems in Manufacturing, May 17-19 2006, Saint-Etienne, France, p. 261-267.

Zaitsev D.A., Shmeleva T.R. Switched Ethernet Response Time Evaluation via Colored Petri Net Model , Proc. of International Middle Eastern Multiconference on Simulation and Modelling, August 28-30, 2006. - Alexandria (Egypt). - 2006. - P. 68-77.

Zaitsev D.A. Compositional analysis of Petri nets, Cybernetics and Systems Analysis, Volume 42, Number 1 (2006), 126-136, DOI: 10.1007/s10559-006-0044-0

Zaitsev D.A. Enterprise Petri net based CAM software Opera-Topaz, Proc. of 3rd International Industrial Simulation Conference 2005 (ISC 2005), June 9-11, 2005 - IPK Fraunhofer Institute, Berlin, Germany, pp. 124-128.

Zaitsev D.A. Decomposition of Petri Nets, Cybernetics and Systems Analysis, Volume 40, Number 5 (2004), 739-746, DOI: 10.1007/s10559-005-0012-0

Zaitsev D.A. Invariants of Timed Petri Nets, Cybernetics and Systems Analysis, Volume 40, Number 2 (2004), 226-237, DOI: 10.1023/B:CASA.0000034448.97077.dd

Zaitsev D.A. Switched LAN simulation by colored Petri nets , Proceedings of European Simulation and Modelling Conference, Naples, Italy, October 27-29, 2003, p. 485-489.

Zaitsev D.A., Sarbei V.G., Sleptsov A.I., Synthesis of continuous-valued logic functions defined in tabular form, Cybernetics and Systems Analysis, Volume 34, Number 2 (1998), 190-195, DOI: 10.1007/BF02742068

Zaitsev D.A., Sleptsov A.I. State equations and equivalent transformations for timed Petri nets, Cybernetics and Systems Analysis, Volume 33, Number 5 (1997), 659-672, DOI: 10.1007/BF02667189

Complete list of papers, software, and models on <http://daze.ho.ua>