

MAKARENKO ALEXANDER (OLEKSANDR) SERGEEVICH

(current head of department, 2007 -)

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makalex51@gmail.com



Doctor of Science, Professor

PERSONAL DATA

Date of birth: 31\10\1951 in Kyiv (UKRAINE), graduated from 145 school in Kiev (1968).
More personal details: Marques Who's Who in Science (2000) Who's Who in the World (2009, 2012)

Received Professor Title in Ukraine 2004

Received Doctor Degree of Science 1996 (highest degree in Ukraine) on Mathematical Modeling (Institute of Cybernetics, National Academe of Science, Ukraine)

Title: Mathematical Modeling of fast heat and mass transfer processes

Received Ph. D. on Theoretical Physics in 1985 (Odessa State University, Ukraine)

Title: Mathematical modeling of fast heat conduction processes)

Graduate from Moscow Physic- Technical Institute (Moscow) in 1974 Specialty: physics

AFFILIATION

National Technical University of Ukraine (KPI),
Scientific- educational complex 'Institute for Applied System Analysis',
Department of Applied Nonlinear Analysis, Head of Department
Department Mathematical Methods of System Analysis, Professor
Head of International office at Institute for Applied System Analysis
Head of non-governmental organization SEIS (Socio-economical innovations in society)

EXPERIENCE

TEACHING EXPERIENCE:

Lecture courses at domestic university:

Functional Analysis; Probability theory and mathematical Statistics; Nonlinear Analysis; Linear Algebra and Analytical Geometry; Mathematical Modeling of Physical Processes; Numerical Solution of Singularly Perturbed Equations; Mathematical Modeling of Social Processes; Introduction to Neural Network Methods; Introduction to Social Informatics; Synergetics of Social Processes; Ideas and Concepts of Contemporary Science.

Visiting professor at: University of Salerno (Italy), Academy of Mining and Metallurgy (Krakow, Poland), University of Groningen (Holland), Institute of Bionics at TU Berlin (Berlin), Institute of Bioinformatics (Munich), Fourier University (Grenoble), TU of Vienna (Vienna)

Adviser of more then 10 Ph.D. students and more then 60 graduated students

Creator of new educational specialty in Ukraine - SOCIAL INFORMATICS

Lecturer at new educational specialty SUSTAINABLE DEVELOPMENT AND GOVERNANCE: GLOBAL AND REGIONAL CONTEXTS – Courses: ‘Global Modeling of Sustainable Development’; ‘Mathematical Optimization and Modeling for Regional Environmental Management’.

EDITORS ANA REVIEWRS

Member of journals editorial boards:

Geoinformatica Polonica (Poland)

Mathematical Modeling (Ukraine)

Analysis, Modeling and Control (Ukraine)

Vistnik of Vinnitza Politechnic Institute (Ukraine)

Research Bulletin of NTUU ‘KPI’ (Ukraine)

System Analysis and Information Technologies (Ukraine, formerly)

Reviewer in journals:

Optimization (Taylor & Francis)

Optimization Letters (Springer)

European J. of Operational research (Elsevier)

Review of Mathematical Physics

Nonlinear Analysis: Modeling and Control (Lithuania)

Reviewer of more than 30 papers at international conferences

MEMBERSHIP

ESSA – European Social Simulation Association; Euroscience; International Society of Gaming and Simulation (formerly); International Society of System Research (formerly); IFAC Working Group Supplementary Ways for Improving International Stability (SWIIS) (formerly); Conflictological Society of Ukraine; Atlantic Council of Ukraine; iNEER – International Network Engineering Education and Research; BIONIK-International

AWARDS

Membership in International Academy of Art, Science and Technology (IIAS, Windsor, Canada)

Best Papers Awards at Int. Conf. CASYS'2005 (Liege, Belgium, 2005)

Best Papers Awards at Int. Conf. CASYS'2000 (Liege, Belgium, 2000)

Official letters with gratitude from exhibitions CeBIT 2006 (Germany), Ukraine-Poland 2004

SOME RECENT PUBLICATIONS, mostly at English (1996 – 2015):

1. Makarenko O.. Neural Networks with Strong Anticipation and Some Related Problems of Complexity Theory. In: Complex Systems, Studies in Systems, Decision and Control, ed. G.M. Dimirovski. Springer-Verlag. 2016. Pp. 259 – 274.
2. Makarenko A. Multiscale and Applied Systems Analysis of a Brain Activity. I. General Description. Algebras, Groups and Geometries, 2015, vol.32, n.4. pp. 440-460
3. Danilenko V.A., Danevich T.B., Makarenko O.S., Skurativskiy S.I., Vladimirov V.A. Mathematical Modeling of Spatial and Temporal Nonlocalities on Nonlinear Waves Evolution. Algebras, Groups and Geometries, 2015, vol.32, n.4. pp. 495-524.
4. Makarenko A. Mathematical Modelling of the System of Chains of Coupled Elements with Strong Anticipation. Algebras, Groups and Geometries, 2015, vol.32, n.4. pp. 545-558.
5. Makarenko A. The Principles, Models and Applications in Society Evolution. Book of Abstracts. 1st Int. Conf. on ANTICIPATION, 05-07 November 2016. Univ. Trento, Italy 2015. P.74.
6. Makarenko A. Toward Multivaluedness Aspects in Self-Organization, Complexity and Computations Investigations. Forth Int. Workshop on Nonlinear Dynamics and Synchronization INDS'15, July 31, Klagenfurt, Austria, Alpen-Adria University, 2015. Pp. 84-93.
7. Danilenko V.A., Danevich T.B., Makarenko O.S., Moskaliuk N.M., Skurativskiy S.I., Vladimirov V.A. Qualitative analysis of mathematics models of relaxing media with spatial and temporal nonlocality Algebras, Groups and Geometries, 2015, vol.32, n.1. pp. 1-52.
8. Danilenko V.A., Danevich T.B., Makarenko O.S., Moskaliuk S.S., Skurativskiy S.I., Vladimirov V.A. Mathematical modeling in hydrodynamics with memory. Algebras, Groups and Geometries, 2015, vol.32, n.1. pp. 53-88

9. Makarenko A., Samorodov E. Geoinformational systems as the tool for reforms supporting. Problems, examples and possibilities. Materials of 5th Int. sci. conf. 'Information technologies and computer engineering' Ivano-Frankivsk, Ukraine, 27-29 May 2015. Pp. 51-52. [in Ukrainian]
10. Makarenko A. System analysis in brain, hierarchy of their models and possibilities for artificial intelligence development. Computational Intelligence. 3rd Int. Conf. Tcherassy, Ukraine, May 2015. 2 p. [in Ukrainian].
11. Terpil I., Makarenko A. Simulation of public opinion with ideas of cellular automata. LNCS. # 8751, 2014. 518-525 p.
12. Makarenko A. Towards system analysis and modeling of global sustainable development. In: Civilization at the Crossroads Response and Responsibility of the Systems Sciences. Book of Abstracts of European Meetings on Cybernetics and System Research. BCSSS, Vienna, 2014. pp. 427-430,
13. Zavertanniy V.V., Makarenko A. Interactions and changing of cooperating strategy of artificial life with nonhomogeneous space. In: Analysis, Modeling and Control. Kyiv, IASA, 2013. vol. 1. pp. 27-41. (in Ukrainian).
14. Danilenko V.A. et al. Group analysis of reaction-Diffusion Convection of Nonlinear Equations. Algebras, Groups and Geometries (USA), 2013. vol. 30, n.3, pp. 275-365.
15. Makarenko A. Systems and models with anticipation in physics and applications. Journal of Physics: Conference Series. 2012. vol. 394(1), 012026, 6 p.
16. Makarenko A., Musienko A., Popova A., Poveshenko G., Samorodov E., Terpil E., Trofimenko A. Cellular Automata, Agents with Mobility and GIS for Socio-Environmental Problems. Journal of Earth Science Research, 2013. Vol. 1(1). Pp. 10-19.
17. Makarenko A. Simulation of discontinuous solutions in evolutionary equations. New approaches for reducing non-physical oscillations and smoothing in numerical solutions. Algebras, Groups and Geometries, 2012, vol.29, n.2. pp. 161-170
18. Danilenko V.A., Danevich T.B., Makarenko O.S., Moskaliuk N.M., Skurativskiy S.I., Vladimirov V.A. Algebro-invariant models for nonlinear nonlocal media. Algebras, Groups and Geometries, 2012, vol.29, n.3. pp. 309-376
19. Makarenko A., Kirvelis D. The Ukrainian bifurcation point in innovative technologies and education as a contrast to the development of Lithuania. International business: Innovations, Psychology, Economics, 2013. vol.4, n.1(6). Pp. 7-16
20. Makarenko A. Neuronet-type models of large-scale socio-economic systems with intellectual elements. International business: Innovations, Psychology, Economics, 2013. vol.4, n.1(6). Pp. 65-83.
21. Makarenko A. Cellular Automata with Strong Anticipation Property of Elements. Proc. 19th Int. Workshop on Cellular Automata and discrete Complex Systems (AUTOMATA-2013) – Exploratory Papers (Gissen, Germany, 17-19 September 2013). IFIG Research Report 1302, 2013, pp. 49-56..
22. Makarenko A. Towards understanding of risks and sustainability on global, regional and local levels. 26th European Conference of operational research EURO-26, Roma, Italy, 01-04 July 2013. p. 30
23. Makarenko A. Mathematical models for hyperbolic hydrodynamics with memory and special solutions with self-origins of collapse. Book of Abstracts of MMM-13: Mathematics, Mechanics and Modeling, a tribute to Zbigniew Peradzynski, joint with 13th Conference Mathematics in Technical and Natural Science, Bedlewo, Poland, 23-27 September 2013. 1 p.

24. Makarenko O. Mathematical Modeling of Brain Activity Connected with Information and the Structure of Universe. Abstract of 6th Int. Conf on memory of A. Petrov. Kiev, 05-08 September 2013. Int. Theor. Phys. NAS of Ukraine. P. 18.
25. A Makarenko, A Musienko, A Popova, G Poveshenko, E Samorodov, A Trofimenko Cellular Automata, Agents with Mobility and GIS for Practical Problems. Lecture Notes Computer Science n. 7495, Springer, 2012. 738-742
26. The SUSTAINABLE future of humankind V. The action plan (electronic version). Timi Ecimovich and Roger Haw et al. – Korte: SEM Institute for Climate Change, Slovenia, 2012. 102 p. ISBN 978-961-93136-7-1 (pdf).
27. A.Makarenko Model equations and formation of structures in media with memory. Ukr. J. Phys. 2012, vol. 57, n. 4. pp. 408 – 421.
28. Makarenko A. On presumable role of anticipation effects in neurophysiology and consciouneress (short abstracts) Proc. XVI Int. Conf. On neuro -cybernetics (ICNC-12). 24-28 Sept. 2012. Rostov-on-Don, Russia. 3 pc. (in Russia).
29. A.S. Makarenko Strong anticipation systems as a source of mathematical problems. Book of Abstracts Int. Conf. «Dynamical Systems and their Applications», Kyiv. Int. of Mathematics, 16-17 May 2012. P.25
30. Makarenko Lessons from Bruntland’s commission report and future tasks: knowledge as the main resource for sustainable development. Proc. 14th Int. Conf. “Sustainable development and eco-innovation in relation to the United Nations Earth summit. Focus on green economy. 6-8 September 2012, Krakow, Poland. Pp. 65-66.
31. Makarenko, G. Poveshenko, E. Samorodov Development and prospects of mathematical modeling and GIS applications for natural, social, technical systems. Proc. 14th Int. Conf. “Sustainable development and eco-innovation in relation to the United Nations Earth summit. Focus on green economy. 6-8 September 2012, Krakow, Poland. P. 67.
32. Makarenko A. Poveshenko G., Samorodov E. OR approaches for forecasting, managing and transparency supporting of election campaigns in developing countries Abstracts of Workshop ‘EWG-ORD PhD Workshop’ at EURO XXV, Vilnius, Lithuania, 8-11 July, 2012 . 1 p.
33. Danilenko V., Danevich T., Makarenko A., Skurativskyi S. Vladimirov V. Self-organization in nonlocal non-equilibrium media. Kyiv: S.I. Subbotin Institute of Geophysics, NAS of Ukraine, 2011. 333 p.
34. Makarenko A. Some distributed systems with anticipation. Int. J. of Computing Anticipatory Systems. (Belgium), 2010. vol. 24, pp. 21-32.
35. Makarenko A. Toward complex behavior and synchronization in networks and chaos with strong anticipation. Proc. Of Third Int. Workshop on Nonlinear Dynamics and Synchronization. 25th-27 th July 2011, Klagenfurt, Austria. Alpen-Adria Univ, Klagenfurt, 2011. pp. 100-104.
36. Makarenko A. Neural networks with anticipation and some problems of complexity theory. Proceedings of Int. Conf. on Complex Systems: Synergy of Control, Communications and Computing – COSY 2011, Ohrid, Macedonia, 2011. pp. 257 – 262.
37. Makarenko A. Sustainable Development as Weak and Strong Anticipation Problems. Abstracts Book of 10th Int. Conf. CASYS 2011, Liege, Belgium, August 2011. 2011. 1p.

38. Lazarenko S., Makarenko A., Investigation of Complex Multivalued Solutions in Discrete Dynamical Systems with Anticipation. Abstracts Book of 10th Int. Conf. CASYS 2011, Liege, Belgium, August 2011. 2011. 1p.
39. Makarenko A. Anticipatory systems: models and applications. Abstracts Book of 12th Int. Conf. Applications of mathematics in science and technic, Krinica, Poland, September 2011. 2011. 1p.
40. Krushinski D., Makarenko A. Cellular automata with anticipation: examples and presumable applications. Computing Anticipatory Systems, AIP Conf. Proceed. Series Vol.1303, ed. D. Dubois, AIP N.- Y. 2010, Pp.246 – 254.
41. Makarenko O., Poveshenko G., Samorodov E. GIS, e-services and models for monitoring, forecasting and transparency supporting of election campaigns, experience of development, applications and implementation Proceed. Int. Conf. 8th International Eastern European e/Gov Days, Ljubljana, Slovenia, May 2011, Austrian Computer Society: Wien, 2011 pp. 255 – 261.
42. 3. A. Makarenko, D. Krushinskiy, A. Musienko, B. Goldengorin Towards Cellular Automata Football Models with Mentality Accounting, pp. 149-152. Lecture notes Computer Science, n. 6350. Springer-Verlag, Berlin-Heidelberg-New-York, 2010 ISSN 0302-9743, ISBN-10 3-642-15978-8
43. Recent Advances in Nonlinear Dynamics and Synchronization: Theory and applications. Eds. Kyamakya K., Halang W.A., Unger H., Chedjou J.C., Rulkov N.F., Li Z., Springer, Berlin/Heidelberg, 2009. 404 p. ISBN 978-3-642-04227-0. Chapter: Synchronization of Movement for Large – Scale Crowd. B. Goldengorin, D.Krushinski, A. Makarenko pp. 277 – 303.
44. Simulation and Optimization Methods in Risk and reliability Theory. Eds. P.S.Knopov, P.M.Pardalos, Nova Science Publishers, Inc. N.Y., USA, 2009. 275 p. ISBN 978-1-60456-658-1. Development of new Mathematical Models and Methods for Determining Critical States of Nuclear Plant Reactors. V.A.Yatsenko, P.M. Pardalos, A.S. Makarenko, Y.I. Samoilenko pp. 137 -172
45. Makarenko A. Different type of chaotic behavior for different space and time scales in complex systems. Proceedings INDS'09 Second Int. Workshop on Nonlinear Dynamics and Synchronization, Klagenfurt, AUSTRIA, 2009. PP. 60-64.
46. Makarenko A. General problems of sustainable development and transformation processes in large socio-economic systems. Proceed. Of 5th Int. Conf. “Knowledge – Based technologies and OR methodologies for Strategic Decisions of Sustainable development, Vilnius, 2009. p.159 – 163.
47. Makarenko A., Goldengorin B. , Krushinskii D. Game ‘Life’ with Anticipation Property. Lecture Notes Computer Science, N. 5191, Springer, Berlin-Heidelberg, 2008. p. 77-82.
48. Makarenko A., Krushinski D., Goldengorin B. Anticipation and Delocalization in Cellular Models of Pedestrian Traffic. Proceed. Of INDS 08, Klagenfurt, Austria, July 2008. 2008. p.61-64.
49. Makarenko A. Toward Decision- Making Considerations on the base of Society Models with Anticipation. Proceed. Third Int. Conf. Human Centered Process, June 2008, Delft, The Netherland, Ed.: Telecom Bretagne, 2008. p. 25- 34.
50. Makarenko, S.Levkov, V.Solia // Associative Memory Approach Modeling Stock Market Trading Patterns //System Research and Informational Technologies 2007.– № 4, 15 p.
51. Makarenko A., Stashenko A. (2006) Some two- steps discrete-time anticipatory models with ‘boiling’ multivaluedness. AIP Conference Proceedings, vol.839, Computing Anticipatory

- Systems CASYS – Seventh Int. Conf. Liege, Belgium, August 2005, ed. Daniel M. Dubois, USA, pp.265-272.
52. Makarenko A. (2006) Neural networks for modelling of large social systems. Approaches for mentality, anticipating and multivalued accounting. *Int. Journal Information Theories & Applications*, vol.13, n.4. pp. 371- 375.
 53. Gaeta M., Iovane G., Makarenko A. (2005) Information theory and possible mathematical description of economical and social systems based on real physical phenomena. *System Research and informational Technologies*, 2005, n.4. pp.52- 64
 54. Tetko I., Gasteiger J., Todescini R., Makarenko A., et al (2005) Virtual Computer Chemistry Laboratory – design and description. *J. of Computer Aided Molecular Design*, vol.19. pp. 453-463.
 55. Makarenko A., Sagaidac L. (2005) Computation of Information Content of Data Analyzing Their Symmetry. *Proceed. IEEE Int. Workshop IDAACS'05: Intelligent Data Acquisition and Adv. Computing Systems: Technology and Applications. (Sofia, Bulgaria, 2005).* 4 p.
 56. Poliarush A., Tetko I., Makarenko A. (2005) Burst recognition Algorithm Based on Symmetry Properties. *Proceed. IEEE Int. Workshop IDAACS'05: Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications. (Sofia, Bulgaria, 2005).* 4 p.
 57. Makarenko A. (2003) Sustainable Development and Risk Evaluation : Challenges and Possible new Methodologies, In. *Risk Science and Sustainability: Science for Reduction of Risk and Sustainable Development of Society*, ed. T.Beer, A.Izmail- Zade, Kluwer AP, Dordrecht, pp. 87- 100.
 58. Poliarush A., Makarenko A., Tetko I. (2003) Spike separation based on symmetries analysis in phase space. *System Research and informational Technologies*, 2003, n.2. pp.124- 135.
 59. Makarenko A. (2001) Complexity of Individual Objects Without Including Probability Concept: Asymmetry, Observer and Perception Problems; In: *Computing Anticipatory Systems*, ed. D.Dubois. Amer. Inst. Of Physics, 2001 ; vol. 573. pp. 201-215.
 60. Makarenko A. (2000) Social informatics- new educational speciality in applied mathematics and computer science curricula; In: *Preprints of SWIIS 2000: Instability resolution in regions of long confronted nations*, IFAC and ETAI , Scople MK, May 2000. 3 P.
 61. Makarenko A., Moskalkov M., Levkov S. (1997) On blow- up solutions in turbulence. *Phys. Letters A*, vol.235, pp. 391- 397.
 62. Makarenko A. (1997) Finite- dimensional dynamical systems with chaos and the models of hydrodynamics with memory effects. *Proceed. Of 15 th Intern. World Congress in Mathematical Modelling and Simulation, Berlin, August 1997.* pp.43-45.
 63. Rolinsky R., Makarenko A. (1997) “Dry turbulence” as a test for chaos computation in distributed systems. *Abstracts book: Int. Conf. TIMPANI- MATHPYS, Kiev, 1997*, p.98.
 64. Makarenko A. *Mathematical Modeling of memory effects influence on fast hydrodynamic and heat conduction processes. Control and Cybernetics*, 1996, vol. 25, n.3, pp. 621- 631.

190 RECENT PUBLICATIONS (1996 – 2015), 71 PUBLICATIONS before 1996

CONFERENCES AND WORKSHOPS ORGANISERS

Co-chair and co-organizer NATO ARW “The Impact of recent global Crises on Human awareness and Behavior in risk Conditions” (2006)

Scientific Secretary and one of organizers of 1st – 3rd Int. Conferences ‘Nonlinear Analysis and Applications (Kiev, Ukraine, 2010, 2012, 2015).

Member of org-committee (PC) of more then 20 meetings including

AACIMP 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 – 1-9th International Summer Science School-Seminars ‘Achievements of Contemporary Informatics, Mathematics and Physics’
Chare and Co- chair of more then 30 sessions at international conferences

PARTICIPATION IN INTERNATIONAL CONFERENCES ABROAD AS:

ANTICIPATION (Trento, Italy, November 2015), MNTP’15 (Zacopane, Poland, September 2015), 35th Conf. on system analysis and cybernetics (Baden-Baden, August 2015), INDS’15 (Klagenfurt, July 2015), DYMULT’15 (Dresden, June 2015), Scholarships for Science and Education (Bern, Switzerland, January, 2015), ACRI 2014 (Krakow, September 2014), EURO 26 (Roma, July 2013), AUTOMATA2013 (Giessen, Germany, September 2013), MNTP’12 (Krynica, Poland, September 2013), ACRI 2012 (Santorini, September, 2012), ICNC-12 (Rostov-on-Don, September,2012), ICCS-12 (Kazan, August 2012), COSY’11 (Ohrid, Macedonia, 2011), INDS’11 (Klagenfurt, 2011, MNTP’12 (Krynica, Poland, 2012), eGovDays (Ljubliana, Slovenia, May 2011), MNTP’10 (Krynica, Poland, 2010), ICDN-09 (Sevillia, 2009); EURO 23 (Bonn, 2009); INDS’09 (Klagenfurt, 2009); ICNC-09 (Rostov – on –Don, 2009); 5th Int. Conf. “Knowledge – Based technologies and OR (Vilnius, 2009); DISMA 08 (Elche 2008); INDS’08 (Klagenfurt, July 2008); eGovDays (Prague, April 2008); Human – Centred Processes (Delft, June 2008); Workshop on Bionics (Berlin, June 2007, December 2009); EURO XXII – European Conference on Operational Research (Prague, July 2007); Cellular automata for research and industry. ACRI 2006, (Perpignian, France, 2006); NATO ARW The Impact of recent global Crises on Human awareness and Behaviour in risk Conditions (Tallinn, Estonia, 2006); 4 th Eastern European e-Gov Days (Prague, Chechia,2006); World Exhibition CeBIT (Hannover, Germany, 2008, 2006, 2005, 2004, 2003, 2002); CASYS (Liege, Belgium, 2005, 2007, 2009, 2011)

SPEAKER ON MORE THEN 100 INTERNATIONAL AND DOMESTIC CONFERENCES AT OTHER FORMER USSR COUNTRIES

SCIENTIFIC INTERESTS

SHORT DESCRIPTION IN SCIENTIFIC RESEARCH AND INTERESES

1. E – GOVERNANCE.
2. COMPLEXITY AND SYMMETRY.
3. SELF-ORGANIZATION.
4. CELLULAR AUTOMATA.
5. LIFE SCIENCE.
6. SOCIO-ECONOMICAL MODELS.
7. NEURONAL NETWORKS.
8. SIGNAL PROCESSING.
9. GEOPOLITICS AND GLOBALISTICS.
10. GIS APPLICATIOND.
11. NUMERICAL METHODS.
12. MATHEMATICAL MODELING.
13. SUSTAINABLE DEVELOPMENT.
14. HYDRODYNAMICS WITH MEMORY AND NONLOCALITY EFFECTS.
15. ANTICIPATORY SYSTEMS.
16. DYNAMICAL SYSTEMS AND CHAOS.
17. NEUROCOMPUTING
18. TRANSFORMATION OF SOCIETI