

Roman L. Tankelevich, PhD

Synopsis

Researcher and developer in the field of mathematical modeling and computer simulation with applications in different fields of science and engineering. Published six books, many papers, obtained more than 15 patents. Educator in mathematical and computer sciences. Helped to organize and manage a number of R&D oriented companies.



Professional Recognition

<i>New York Academy of Science</i> , member	1982 – 1991
<i>Who's Who in the West</i>	1993
<i>Who's Who in Science and Engineering</i>	1995
<i>Who's Who among America's Teachers and Educators</i>	2007
<i>Who's Who in America</i>	2011

Education

Moscow Power Engineering Institute (Technical University), Ph.D. in Computer Science <i>Dissertation</i> : Analog Simulation of certain PDE's	1968
Moscow Engineering Physics Institute (State University), BS, MS <i>Concentrations</i> : digital and analog computers, mathematical modeling and simulation in physics <i>MS thesis</i> : Method of lines for analog modeling of elliptic equations	1963

Research

Colorado School of Mines, <i>Teaching Associate Professor of Computer Science</i> Denver, CO – 2D and 3D geometric modeling and surface reconstruction based on harmonic and biharmonic solutions	2001 –
Luca Technologies Inc. <i>Consultant</i> Denver, CO – modeling of undersurface fields	2010 –
Vision Land Consultants, Inc. <i>Consultant</i> Denver, CO – method of modeling applied to hydraulic models	2005 – 2008
InterPost, Inc., <i>Research and Development, VP</i> Denver, CO – encryption and steganography	2008 – 2009

ArcWorks, Inc., <i>Software Development and Consulting</i> Denver, CO – circular splines based geometry	2000 – 2003
Logixx Automation, Inc., <i>Director of Software Development</i> Denver, CO – geometric modeling and robotics	1994 – 2000
System Six, Inc. <i>Vice President of Research and Development</i> Denver, CO – development of real-time UNIX-like OS	1990 – 1994
Academy of Commerce, <i>Director of Research Laboratory for Computer Systems in Commerce,</i> Moscow, Russia – asynchronous parallel simulation of PDE's; models with RDBMS	1981 – 1990
Moscow Research Institute for Computing Technology <i>Head of Research Laboratory for Physical Simulation</i> Moscow, Russia – simulation and modeling of physical systems	1968 – 1974
Teaching	
Colorado School of Mines <i>Adjunct Professor, Teaching Associate Professor of Computer Science</i>	2001 –
Recently taught courses: <i>Mathematical Modeling, Advanced Engineering Math, Artificial Intelligence, Cryptography, Data Structures, Parallel computations, Programming Languages, Computer Graphics, Machine Learning and Simulation</i>	
Moscow Academy of Commerce <i>Adjunct Professor</i> Moscow, Russia	1985 – 1989
Moscow Technological Institute <i>Assistant Professor</i> Moscow, Russia	1974 – 1981
Moscow Institute for Radioelectronics <i>Adjunct Asst. Professor, Moscow, Russia</i>	1971 – 1974
Moscow Technological Institute <i>Adjunct Instructor</i> Moscow, Russia	1965–1968

Recent Presentations

SpringSim 12, ADS 2012 (Orlando), Full Paper Presentation; <i>"Orthogonal Agents in Modeling and Simulation"</i>	2012
WORLDCOMP 2011 (Las Vegas), Full Paper Presentation; <i>"Modeling with Uncertainty – Interval Computations Using Fuzzy Sets"</i>	2011
WORLDCOMP 2010 (Las Vegas), Full Paper Presentation; <i>"A Steganographic Method Using the Lorenz Chaotic Mapping"</i>	2010
WORLDCOMP 2008 (Las Vegas), Full Paper Presentation; Poster Presentation and Discussion <i>"Electronic Virtual Stamps: A New Paradigm in Internet Communication"</i> , with Pavel Astakhov, Anton Klimov	2008
International Conference of The Engineering Mechanics Institute, em'08 (Minneapolis), Paper Presentation <i>"Geometric Implicit Modeling using a Boundary Collocation Method"</i> , with Graeme Fairweather, Andreas Karageorghis	2007
APCOM'07-EPMESC XI (Kyoto, Japan), Paper Presentation <i>"The Application of the Method of Fundamental Solutions in Geometric Modeling"</i> , with Graeme Fairweather, Andreas Karageorghis, Yiorgos-Sokratis Smyrlis	2007
1 st MFS Workshop (Cyprus), Paper Presentation <i>"Harmonic and biharmonic MFS solutions in geometric modeling and reconstruction"</i> , with Graeme Fairweather, Andreas Karageorghis, Yiorgos-Sokratis Smyrlis	2007
WORLDCOMP 2006, Paper Presentation <i>"Visual Objects Based Introduction to Programming Concepts in the Context of Engineering Education"</i> , with Graeme Fairweather	2006
Minnesota University, Dept. of Civil Engineering <i>"Matrix decomposition algorithms for potential problems"</i> , part of Andreas Karageorghis' lecture	2006
SIGGRAPH 2005, Poster Presentation <i>"The Method of Fundamental Solutions in Geometric Design with Potential Fields"</i> , with Graeme Fairweather, Andreas Karageorghis, Yiorgos-Sokratis Smyrlis	2005
University of Cyprus, Department of Mathematics and Statistics <i>"Implicit Geometric Modeling"</i>	2005

SIGGRAPH 2004, Sketch Presentation <i>"Re-Usable Implicit Functions"</i> , with Alyn Rockwood	2004
SIGGRAPH 2004, Poster Presentation <i>"Potential Fields and Implicit Modeling"</i> , with Alyn Rockwood	2004
Colorado School of Mines, MACS Colloquium <i>"Implicit Modeling and Potential Fields"</i> , with Alyn Rockwood	2004
Moscow State University, <i>Mobile Robotics</i> Conference <i>"Robotic Simulation in Manufacturing Environment"</i>	2002
Colorado School of Mines, MACS Colloquium <i>"Circular Arc Splines in Solid Modeling and Motion Simulation for CAD/CAM Systems"</i>	1999
Moscow Institute for Computer Control Systems <i>"Geometric Modeling with RC (Arc Splines) in Manufacturing Systems"</i>	1998
8 th European Simulation Symposium, Genoa, Italy <i>"Tool Path Simulation For Processing Industries"</i>	1996
Colorado University, Denver, Math Department <i>"Methods of Analog Simulation of Dynamical Systems"</i>	1992
Moscow Institute for Computer Control Systems <i>"Operating Systems for Real-Time Simulation"</i>	1992
6 th Workshop on Parallel and Distributed Simulation, California <i>"An Orthogonal Multiprocessor System For Asynchronous Simulation"</i>	1992
The X Convention On Informatica, Guatemala <i>"Multiprocessor Based Simulation Of Dynamical Systems"</i>	1991
Rocky Mountain News, Denver, public issues seminar, panelist <i>"View On Political and Technological Aspects of Development In The USSR"</i>	1991

Publications

Books:

"Algorithmic Methods of Analog Simulation", (with I.Vittenberg), Energy Publishing House, 1976, p. 376 (in Russian).

"Microprocessor Simulation Systems", Energy Publishing House, 1979, p. 120 (in Russian).

"Statistical Simulation of Dynamical Systems Using Analog Computers", (Ed. I.Vittenberg), Mashinostroenie Publishing House, 1976, p. 200 (in Russian).

"Statistical Methods in Simulation Of Commercial Systems", (with S.Khazardjan), Commerce Publishing House, 1983, p. 50 (in Russian).

"Simulation of Physical Fields Using Analog Computers", (with I.Vittenberg), Energy Publishing House, 1968, p. 128 (in Russian).

"Analog Computers Handbook", Technika Publishing House, 1975, p. 259-325 (in Russian).

Selected Patents:

"A system and method of decision making using interval computations" (with J. Honda). Provisional US Patent # Pending,, 2008.

"A system and method for electronic certification, identification and communication by using encrypted graphic image" (with P. Astakhov, A. Klimov). Provisional US Patent # 61021919 Pending, Feb. 18, 2008.

"Method for Generating Two Dimensional and Three Dimensional Smooth Curves and for Driving Curve Forming Device". US Patent 6,014,148, Jan. 11, 2000.

"Method for Operating a Curve Forming Device". US Patent 5,594,852, Jan. 14, 1997.

"Method and apparatus for forming bends in a selected sequence". US Patent 6,167,740, Jan 2, 2001.

"Computing System for Solution of Differential Equations". (with M.Sulim, and V.Grigoryev) USSR Patent 758170, Apr. 28, 1980.

"Computing System for Solution of Differential Equations". USSR Patent 747328, Mar. 14, 1980.

"Computing System for Solution of Partial Differential Equations". (with M.Maksimov, and Ya.Teitelbaum) USSR Patent 674031, Mar. 22, 1979.

"Device for Solution of Ordinary Differential Equations". (with G.Maisel) USSR Patent 645174, Oct. 6, 1978.

"Computing System for Solution of Differential Equations". (with M.Sulim) USSR Patent 620980, Apr. 27, 1978.

"Device for Solution of Equations of Mathematical Physics". (with M.Maksimov, and Ya.Teitelbaum) USSR Patent 584314, Aug. 22, 1977.

"Computing System for Solution of Differential Equations". (with M.Sulim) USSR Patent 565299, Mar. 21, 1977.

"Device for Program Control of Analog Computers". (with other authors) USSR Patent 220020, Apr. 23, 1968.

Selected Papers:

"Orthogonal Agents in Modeling and Simulation", SpringSim 12, Proceedings of the 2012 Spring Simulation Multi-Conference, March 26-30, 2012.

"Modeling with Uncertainty – Interval Computations Using Fuzzy Sets", (with J. Honda) WORDLCOM'11, Proceedings of the 2011 International Conference on Internet Computing, July 14-17, 2011.

"A Steganographic method using the Lorenz chaotic mapping", WORDLCOM'10, Proceedings of the 2010 International Conference on Internet Computing, July 12-15, 2010.

"Three-dimensional image reconstruction using the PF/MFS technique", (with G. Fairweather, A. Karageorghis), Engineering Analysis with Boundary Elements 33 (2009) 1403–1410.

"Electronic Virtual Stamps: A New Paradigm in Internet Communication", (with P. Astakhov, A. Klimov), WORDLCOM'08, Proceedings of the 2008 International Conference on Internet Computing, July 14-17, pp. 269-275, 2008.

"The Application of the Method of Fundamental Solutions in Geometric Modeling", (with G. Fairweather, A. Karageorghis, Y.-S. Smyrlis), APCOM'07-EPMESC XI; (electronic publication) MS3-1-1, December 3-6, 2007, Kyoto, JAPAN, pp. 1 – 10, 2007.

"Potential Field Based Geometric modeling Using the MFS", (with G. Fairweather, A. Karageorghis, Y.-S. Smyrlis) Technical Report, University of Cyprus, 2005, pp. 38.

"Potential Field Based Geometric modeling Using the Method of Fundamental Solutions", (with G. Fairweather, A. Karageorghis, Y.-S. Smyrlis), International Journal for Numerical Methods in Engineering; 68: 1257-1280, 2006.

"An Orthogonal Multiprocessor System For Asynchronous Simulation", in "Proceedings of the 1992 SCS Multiconference on Parallel and Distributed Simulation", A Publication of The Society For Computer Simulation, 1992, pp. 189-190.

"Tool Path Simulation For Processing Industries Based on a New Method of Geometric Modeling", (with V. Pavlovsky) in "Simulation in Industry", A Publication of The Society For Computer Simulation International, 1996, pp. 485-489.

"Recursive Functions Based Approach To Implementation Of Multiprocessor Systems", in "Simulation Of Systems "79", North-Holland Publishing Company, 1980, pp. 179-188.

"Software for Analog Computers with Hybrid Memory and Control Devices", (with V.Ouchakov, and I.Vittenberg), in " The VI AICA Congress", Munich, 1970, pp. 78-85.

"A Microprocessor System for Temperature Stabilization in IR-Laser Spectroscopy", (with others), Lebedyev's Physics Institute, Preprint, 1979, pp. 1-19 (in Russian).

"Dynamical Models of Material Flows ", in "Microcomputers in Commercial Systems", 1987, pp. 15-23, (in Russian).

"Algorithmic Solution Based on Analog Simulation of A Boundary Value Problem", (with V.Suslov) in "Automation and Control Systems", Science Publishing House, 1967, pp. 164-178 (in Russian).

"Problem-oriented Structure of Hybrid Computer Systems", in "Theory and Software for Non-uniform Computer Systems", 1973, pp. 26-31 (in Russian).

"Non-uniform Computer Systems. Definitions and Applications", (with V.Aniskov, and I.Vittenberg), in "Theory and Software for Non-uniform Computer Systems", 1973, pp. 5-21 (in Russian).

"Recursive Functions Based Method for Synthesis of Continuous-Parallel Algorithms", a note in "Simulation of Boundary Value Problems", 1978, pp. 78-80 (in Russian).

"A Model of Material Flows in Retail Trade Systems", in "Retail Trade Real-Time Control Systems", 1984, pp. 20-32 (in Russian).

"Automation of Analysis of Dynamic Processes in Electrical and Mechanical Systems", in "Analog and Hybrid Computers", vol. 6, 1973, pp. 151-163 (in Russian).

"A Programming Language for Analog Computer Systems", in "Analog and Hybrid Computers", vol. 4, 1971, pp. 72-82 (in Russian).

"Continuous-Parallel Algorithms and their Implementation in Physical Simulation", (with O.Zhegalin) in "Analog and Hybrid Computers", vol. 5, 1973, pp. 34-45 (in Russian).

"Software for Analog Computers with Hybrid Memory and Control Devices (for Physical Problems Simulation)", (with V.Ouchakov, and I.Vittenberg), in "Analog and Hybrid Computers", vol. 5, 1973, pp. 50-54 (in Russian).

"A Data Structure Language for Analog Computer Systems", (with others) in "Analog and Hybrid Computers", vol. 3, 1969, pp. 178-194 (in Russian).

"Functional Series Based Methods for Solving PDE Using Analog Computers", in "Problems of Radioelectronics", vol. 2, 1965, pp. 31-39 (in Russian).

"An Algorithmic Language for Hybrid Systems", in "Problems of Radioelectronics", vol. 4, 1973, pp. 82-90 (in Russian).

"Methods of Solution of Heat-Mass Transfer Equations for Physical Processes in Walls ", (with others) in "Problems of Physics in Construction", 1968, pp. 20-36 (in Russian).

"General Description of A Control System for Hybrid Simulation", (with I.Vittenberg) in "Automated Methods for Programming of Analog Computers", vol. 2, 1971, pp. 26-34 (in Russian).

"On Using Finite Difference Operators with Variable Steps for Analog Simulation of PDE", in "Proceedings of the XXI All-Union Radioelectronics Congress", Radio Publishing House, 1965, pp. 120-128 (in Russian).

"Analysis of Computer Systems for Solving PDE by Direct Methods", in "Engineering Problems of the Field Theory", Science Publishing House, Kiev, 1976, pp. 53-59 (in Russian).

"To the Theory of Microprocessor Systems for Dynamical Simulation", a note in "Hybrid Computers and Systems", Science Publishing House, Kiev, 1976, pp. 73-74 (in Russian).

"An Iterative Design of Automated Analog Processor", (with G.Maisel) in "Electronic Simulation", Science Publishing House, Kiev, 1977, pp. 134-141 (in Russian).

"Simulation of Boundary Value Problems Using the Monte-Carlo Method", in "Mathematical Simulation and the Theory of Electrical Circuits", vol. 2, Science Publishing House, Kiev, 1973, pp. 58-64 (in Russian).

"A Method of Automatic Solution of an Unstable Dynamical System", (with E.Lamin) in "Problems of Radioelectronics", vol. 6, 1964, pp. 24-32 (in Russian).

"An Analog Optimizer and ODE Solver for Control of a Technological Process", (with others) in bulletin "Science and Technology", No 5-65-1738/39, pp. 1-32 (in Russian).

"Efficient Structures of Analog and Hybrid Computers for Simulation of PDE", (with I.Vittenberg and E.Lamin) in "Theory of Analog and Hybrid Computers", Science Publishing House, 1969, pp. 89-95 (in Russian).

"Non-Stationary Equations of Moisture Transfer in Civil Construction", (with others) in "Modern Methods of Physics in Construction", Science Publishing House, 1968, pp. 56-63 (in Russian).

"Simulation of Electronic Systems", (with G.Berdyakov and I.Vittenberg) in "Methods of Design of Radioelectronic Devices", 1970, pp. 41-46 (in Russian).

"A Hybrid Model of Macroeconomic Systems", (with L.Raikov) in "Hybrid computers in Analysis of Economic Systems", 1970, pp. 92-97 (in Russian).

"Polychronic Control in Hybrid Computers", in "Mathematical Simulation and Theory of Electrical Circuits", vol. 7, Science Publishing House, Kiev, 1970, pp. 121-126 (in Russian).

"Automatic Programming of Functional Transform Devices", (with others) in "Problems of Radioelectronics", vol. 2, 1970, pp. 46-52 (in Russian).

"Evaluation of Performance of Hybrid Computers", (with A.Varukha and I.Vittenberg) in "Problems of Radioelectronics", vol. 2, 1972, pp. 46-52 (in Russian).

"Analysis of Parallel Data Exchange and Conversion in Hybrid Systems ", (with V.Aniskov, and I.Vittenberg), in "Methods of data conversion", MDNTP, 1975, pp. 71-75 (in Russian).

"Interactive Speech Synthesis System Based on Modeling of Vocal Tract ", (with V.Belilovski, and V.Grigoryev), in "Automation in Engineering Research", MDNTP, 1978, pp. 25-29 (in Russian).

"Comparative Analysis of Analog and Microprocessor Simulation", in "Analog and Hybrid Computers", vol. 7, 1978, pp. 120-127 (in Russian).