

ALEXANDER SEROV

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HIGHLIGHTS

- Solid background in physics, mathematics, engineering and philosophy
- Excellent computer proficiency
- Highly committed to continuously updating my professional knowledge
- Excellent communication and interpersonal skills
- Strong analytical mind, self-organized, quick learner, hard worker

ACADEMIC BACKGROUND

- 1999-2002 Ph.D.**
Institute of Design Problems in Microelectronics of Russian Academy of Sciences, Moscow, Zelenograd, Russia
Specialization: Computational Physics
- 1990-1995 Physicist-Researcher's Diploma**
Research Institute "Nauchny Center", Moscow, Zelenograd, Russia.
Specialization: Physics of semi-conductors and dielectrics
- 1982-1988 Master's Diploma of Engineer-physicist with first class honors**
Moscow Institute of Physics and Technology (MPTI), Moscow, Russia
Specialization: Quantum radio-physics.

WORK EXPERIENCE

- 09.2009 – Present Senior Researcher**
Machinery Engineering Research Institute, Russian Academy of Science, Moscow, Russia
Research & Development at the field of methods for automated data processing and finding hidden patterns:
- Developed numerical method for the automated analysis of multidimensional sets of experimental data
 - Developed numerical method realizing combinatorial Group Method of Data Handling (GMDH) for the arbitrary number of arguments. Developed software realization of the numerical method. Developed method is implemented for the problem solution of automatic diagnosis of the investigated technical systems: technical system identification, clustering of experimental data, automated searching for the optimal model, pattern recognition at diagnosis problem, forecasting of characteristics values.
 - Developed software for the automated vibroacoustic data processing acquired during the monitoring process of gas turbine engines. The software implemented methods of spectral analysis, statistical analysis, trend analysis and the method of S – discriminants.
- 08.2010 – Present Contractor**
MicroMasch Ltd, Moscow, Zelenograd, Russia
Research & Development at the field of Artificial Intelligence
- Started the work on the development of neural network (active neurons architecture is based on the Group Method of Data Handling)

03.2010 – 06.2010 Contractor

ANKUD Ltd, Moscow, Zelenograd, Russia

Research & Development at the field of information protection systems:

- Developed methodology for the numerical estimation of the effectiveness of software/hardware realization of information protection systems.
- Software has been developed for the numerical investigation of estimation methodology. Numerical investigation of methodology has been done.
- Investigation of the application of virtualization techniques for the development of data protection systems.

07.2009 – 10.2009 Contractor

Technical Research Center “Turbocontrol”/Public Corporation “Gazprom”, Moscow, Russia

Method development for the automatic efficiency control of the registration tract equipment of the vibroacoustic monitoring system:

- Development of the numerical method and control algorithms as a team member
- Developed numerical model of control algorithms. Algorithms functioning is investigated at numerical experiments.
- Developed the software realizing control algorithms for the use at the monitoring of turbine engines

09.2008 – 06.2009 Investigator

Research Center “Infocomproject”/ Technical Research Center “Turbocontrol”, Moscow, Russia

Development of the architecture of the automatic diagnostics system

Research & Development at the field of methods and algorithms for the automatic diagnostics of the industrial equipment

2006-08.2008 Head of the Information Technology Department

Scan-Plus Ltd., Moscow, Russia

Management of projects “Regional segments of United System of Catalogue” (Projects for Central Bank of Russian Federation)

Development of numerical methods for the investigation of ultrasound waves scattering by phononic crystals:

- Developed numerical method of ultrasound waves scattering by phononic crystal. Method is based on the FDTD/FETD realization of Galerkin technique
- Developed software realization of proposed numerical method

2005-2006 Principal specialist

Scan-Plus Ltd., Moscow, Russia

Management of project “The system of reserve copying of information resources” (The project for company “Gazexport”)

Development of numerical methods for the investigation of electromagnetic fields’ configuration:

- Developed numerical method of Maxwell equations solution based on Finite Differences Analysis
- Developed numerical method for the simulation of ions transfer in high-frequency electro-magnetic fields

2003-2005 Senior research scientist

Institute of Design Problems in Microelectronics of Russian Academy of Sciences, Moscow, Zelenograd, Russia

Development and implementation of numerical methods for the investigation of Micro-Electro-Mechanical Systems (MEMS):

- Developed and investigated full 3D numerical model of electrostatic MEMS using simulation method based on Finite Elements Analysis
- Created methods of automatic generation of MEMS macromodels based on a Mass-Spring Model including approximation of device structural parameters

2002 – 2003 Postdoctoral Fellow

Laboratory of time-of-flight mass spectrometry (University of Manitoba), Winnipeg, Manitoba, Canada
Development and investigation of ion separation methods

- Investigated ion separation methods in RF-ion guide with axial electric field and gas counter flow
- Developed and implemented mathematical model for ions transfer in quadrupole region of mass spectrometer
- Designed software programs for experimental mass-spectrometry data analysis
- Experimentally analyzed structures of peptides using orthogonal injection time-of-flight mass spectrometer

2001 – 2002 Senior research scientist

Institute of Design Problems in Microelectronics of Russian Academy of Sciences, Moscow, Zelenograd, Russia

Investigation of the problem of algorithmic compensation of structural defects at systolic matrixes

- Designed numerical models of cellular automata
- Investigated their application to numerical integration problems with algorithmic compensation of structural defects

2000 – 2002 Engineer

Research Center “MicroStyle” / Motorola Research Laboratory, Moscow, Zelenograd, Russia

Development and investigation of numerical models for fast simulation of electric circuits in semiconductor devices (Project “Fast SIMulator of electric circuits”)

- Created and tested reduction algorithm for passive RC-networks based on a projection technique
- Developed Subcircuit Transistor Model (STM) with further application of FSIM STM software for BSIM3, BSIM4, B3SOI, SSIM, SSIMSOI technologies
- Designed software program for investigation of new Motorola MICA/FSIM technology

1995 – 2001 Engineer – researcher

Scientific Research Institute “Micropribor” / Technical Research Center “Elsov”, Moscow, Zelenograd, Russia

System development and system analysis of a Communications-Satellite Network “Bankir”

- Developed channel and network communication protocols
- Created numerical method and analyzed operation of designed protocols in a group of earth-based stations
- Developed numerical model of carrying-capacity of space network, investigated the data transfer parameters for various architectures of the network
- Participated in software development for the Control Center of Space Network, designed programs responsible for the allocation and re-allocation of space channel resources
- Participated in development of a software-hardware complex for the control of frequency and power resources of a satellite, elaborated measurement and data interpretation technique
- Developed control algorithms for of earth-based power transmitter stations

1990 – 1995 Physicist – researcher

Scientific Research Institute “Nauchny Center”, Department of Space Materials, Moscow, Zelenograd, Russia

Investigation of growth process of semiconductor monocrystals

- Created numerical method for Stephan problem solution based on Finite Differences Analysis
- Numerically investigated growth of semiconductor monocrystals under normal and low gravity conditions
- Participated in design of technological equipment for growth of monocrystals onboard the orbital station “Mir”

1989 – 1990 Engineer – programmer

Scientific Research Institute “Nauchny Center”, Department 52, Moscow, Zelenograd, Russia
Methods and software development for the testing of designed RISC processor

LANGUAGES

Fluent in English, Russian native speaker

COMPUTER PROFICIENCY

Operating Systems: UNIX / Solaris, Linux, Mac OS, Microsoft Windows, MS DOS.
Programming languages: C/C++, Fortran, Pascal, Borland Delphi.
Computational tools: Matlab, Mathcad.

INTERESTS

Music (especially jazz). Chess. Books. Philosophy (especially of Christian Gnostics and of Hinduism)

PUBLICATIONS:

1. **Serov A.A.**, Dolaberidze G.V., Ivanova M.A., Sokolova A.G., Vlasishen Yu. “Software Package for the Vibro-monitoring and Diagnostics of Gas Turbine Engines Realizing the Method of Discriminant Analysis” // will be published at the Proceedings of III-rd International Conference “Aero Engines of XXI Century”, Moscow, 30.11-03.12 2010 (<http://aeroconf.ciam.ru>)
2. **Serov A. A.** “The Problems of Automatic Data Processing at the Systems of Condition Monitoring of Industrial Equipment” // Proceedings (preliminary) of the 10-th European Conference on NDT, Moscow, June 2010
3. Izotov A.V., **Serov A. A.** “The Method for the Trustworthiness’ Identification of the Vibroacoustic Monitoring Data of the Industrial Equipment”, in press
4. **Serov A. A.** “Application of GMDH at the problems of automated identification”, in press
5. **Serov A. A.** “Simulation Methodology of Micro-Electro-Mechanical Systems. Part one: Full 3D models” // Canadian Applied Mathematics Quarterly (CAMQ), V.13, N 4, Winter 2005, 345 - 367
6. **Serov A.**, Rusakov S., Egorov Yu. “Development of methodology, algorithms and software for the behavioral simulation of dynamical systems including components of various physical nature”, Scientific program of Russian Academy of Sciences “Fundamental basis of informational technologies and systems” // Scientific Report, Institute of Development Problems in Microelectronics, Moscow, Russia, 2004
7. **Serov A.A.**, Maslovsky V.M., Rusakov S.G., Kuznetsov I.A. “Influencing of oscillations of an external thermal field on processes of CdHgTe crystallization” // Journal of Advanced Materials, 2002, 5, 31-37
8. **Serov A.A.** “Algorithm of passive RC - schemes reduction under the characteristics in frequency domain” // PeaCE /OLCC Progress Report, January 2001
9. **Serov A.A.** “Investigation of algorithms for compensation of structural defects of systolic matrixes”, Scientific Report, Institute of Development Problems in Microelectronics, Moscow, Russia, 2001
10. **Serov A.A.**, Maslovsky V.M. “Influencing of oscillations of an external thermal field on process of microsegregation at single crystals growth by a method of a directional crystallization” // Proceedings of European Materials Research Society Spring 2001 Meeting. - Strasbourg, France, 2001 - A-II.9
11. **Serov A.A.**, Maslovsky V.M. “Development of a non-uniformity of a structure at single crystal’s growth of semiconductor materials from a melt” // Proceedings of the XXX International Seminar “Noise and degradation processes in semiconductor devices”, Moscow, Russia, 2000, 235-240
12. Maslovsky V. M., **Serov A. A.** “Numerical simulation of single crystals growth from a melt by a method of a vertical directional crystallization” // Fundamental Problems of Developing Advanced Materials and Processes of the XXI Century, V Russian–Chinese International Symposium. Tomsk, Russia, 1999, pp. 86 - 93

13. **Serov A.A.**, Maslovsky V.M. “Numerical simulation of axial and radial impurity distribution under GaAs monocrystals growth by vertical directional crystallization method” // Proceedings of European Materials Research Society Spring 1999 Meeting. Strasbourg, France. Thesis C-I/P28
14. **Serov A.A.**, Maslovsky V.M. “Inhomogeneities in axial and radial impurity distribution under Si monocrystals growth by vertical directional crystallization method” // Proceedings of European Materials Research Society Spring 1999 Meeting. Strasbourg, France, 1999. Thesis E/P18
15. Voronov V.V., Malovichko M.M., **Serov A.A.** “The algorithms for the control of transmitters’ power of earth-based stations”, Scientific-Technical Report, Research Center “Elsov”, Moscow, Russia, 1997
16. **Serov A.A.** “Algebraic method of a computational grid generation at the Stefan Problem Solution “ // Journal “Informatsionnie tehnologii”(Russian), 1997, 9, 7-11
17. **Serov A.A.**, Malovichko M.M. “Determination methodology and numerical simulation of throughput capacity of space network “Bankir”, Scientific Report, Research Center “Elsov” , Moscow, Russia, 1995
18. Malovichko M.M., Kozlov V.A., **Serov A.A.** “The channel protocol of space network “Bankir”, Scientific Report, Research Center “Elsov” , Moscow, Russia, 1994
19. Goncharov V.A., Markov E.V., **Serov A.A.** “On the Effect of Residual Microaccelerations on Semiconductor Crystal Growth under Microgravity” // International Aerospace Congress: Theory, Applications, Technologies, August 15-19, 1994, Moscow, Russia; Abstracts, 253
20. Goncharov V.A., Markov E.V., **Serov A.A.** “Control of GaAs Single Crystal Growth by Direction Crystallization under Microgravity” // International Aerospace Congress: Theory, Applications, Technologies, August 15-19, 1994, Moscow, Russia; Abstracts, 254
21. Goncharov V.A., Markov E.V., **Serov A.A.** “A Numerical Simulation of Growth Process of GaAs Single Crystals by a Directional Crystallization Method in Conditions of a Microgravitation“ // Transactions of the First International Aerospace Conference “Perspectives Of Mastering Outer Space”, 28.09-02.10 1992, Moscow, 1995, 57-69
22. **Serov A.A.** “Numerical Simulation of Thermal Conditions of GaAs Single Crystals Growth from a Melt” // Journal “Elektronnaia Tekhnika”, series “Microelectronics” (Russian), 1992, 1, issue 1 (146), 33-38
23. Goncharov V.A., Markov E.V., **Serov A.A.** The theses of the report “A Numerical Simulation of Growth Process of GaAs Single Crystals by a Directional Crystallization Method in Conditions of a Microgravitation” // First International Aerospace Conference “Perspectives of Mastering Outer Space”, 28.09-02.10 1992, Moscow, Russia, 135

REFERENCES

1. Standing, Kenneth, Dr, Professor, Time of Flight Lab, 510 Allen Bldg, Dept. Physics & Astronomy, University of Manitoba, Winnipeg MB. Tel: (1-204) 474-9358 (standin@cc.UManitoba.ca)
2. Loboda, Alexandre, Dr, Senior Researcher, MDS SCIEX, 71 Four Valley Drive, Concord, Ontario, Canada, L4K 4V8. Tel (1-905) 660-9006 x 2647, (1-905) 660-9005 (lobodaav@sciex.com)
3. Rusakov, Sergey, Dr, Professor, Institute of Development Problems in Microelectronics, Russian Academy of Sciences, 124681, Moscow, Zelenograd, ul. Sovetskaja, tel. (7-495) 531-8890 (rusakov@ici.ru)
4. Sokolova, Asja, Dr, Machinery Engineering Research Institute, Russian Academy of Sciences, 101990, Malyi Hariton`evskiy per., d.4, Moscow, Russia, tel. (7-499) 135-0430, (7-499) 135-4050 (agsokolova@gmail.com)