michael dymkov

Curriculum vitae

General

Name	Michael P. DYMKOV
Sex	Male
Date and Place of Birth	October 16, 1951 village Kamennye Lawy, in Shklov Region of Mogilev District, Belarus
Family Status	Married, two sons
Home Address	Masherov avenu, 42-149, 220123, Minsk, Belarus
Office Address	Prof. M. Dymkov, Higher Mathematics Department, Byelorussian State University, Partizanski Avenue, 26, Minsk, 220070, Belarus
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Education

Secondary school(Kamennye Lawy, Shklov District, Belarus)	1958-1968
Byelorussian State University (Belarus, Minsk) Faculty of Applied Mathematics	1968-1973
Post Graduate, Institute of Mathematics the National Academy of Sciences of Belarus, Minsk	1973-1976

Academic Degrees

Master Thesis in Mathematics **(1973)**:
Byelorussian State University (Belarus, Minsk)
Faculty of Applied Mathematics, Department of Optimal Control Theory

Thesis Title: " Dynamic Programming for multivalued optimization "

Supervisor: *P*rofessor Faina M. Kirillova, BSU

Candidat (PhD) Dissertation in Mathematics (1979):
Institute of Mathematics
the National Academy of Sciences of Belarus, Minsk, Belarus
Supervisor Professor Faina M. Kirillova

Doctor Dissertation (Dr.Sc.) (1998):
Institute of Mathematics
the National Academy of Sciences of Belarus, Minsk, Belarus
Dissertation Title: **E**xtremal problems for multiparametric (m-D) control systems
Scientific Supervisor: Academician Ivan V. Gaishun

Supervisors: Prof. Dr. Sc. Valentin V. Gorokhovik (Institute of Mathematics, National Academy of Sciences of Belarus)
Prof. Dr.Sc. Alex G. Nakonechny (Kiev State University)
Prof. Dr. Sc. Anatoly I. Kalinin (Byelorussian State University)

Academic Titles

Senior Research Fellow (1992):
Diploma of the Academy of Sciences of USSR
Moscow, Russia

Professor (2006):
Diploma of Republic of Belarus
Minsk, Belarus

Honors

Presidium of the Academy of Sciences of USSR Prize (1987):
Academy of Sciences of USSR

National Academy of Sciences of Belarus Prize (1998):
Diploma of the National Academy of Sciences of Belarus,
Division of Mathematics, Physics and Informatics Sciences
Minsk, Belarus

Stipendiary of President of Republic of Belarus (2008):

Minsk, Belarus

Professional Experiences

Post-graduate student	1973-1976, Department of Optimal Control, Institute of Mathematics NANB, Minsk, Belarus
Junior Research Fellow	1976-1979, Institute of Mathematics NANB
Research Fellow	1979-1985, Institute of Mathematics NANB
Senior Research Fellow	1985-1997, Institute of Mathematics
Leader Research Fellow	1999-2004, Institute of Mathematics of the National Academy of Sciences, Minsk, Belarus

Current position

Head of Department of Higher Mathematics	2004 — present, Byelorussian State Economic University Minsk, Belarus

Teaching Experiences

Associate Professor	1985-1990, Department of Mathematics, Byelorussian State Polytechnical Academy, Minsk
Associate Professor	1991-1997, Department of Theoretical Mechanics and Robotics, Byelorussian State University, Minsk
Professor	1998-2003, Department of Theoretical Mechanics and Robotics, Byelorussian State University, Minsk
Professor	2004 — present, Department of Higher Mathematics Byelorussian State Economic University, Minsk

Research Fields

- ✓ Dynamical Systems: Optimization and Control Theory
- ✓ nD system theory, multipass and repetitive processes
- ✓ Applied Functional Analysis and Operator Theory
- ✓ Linear and Nonlinear Programming
- ✓ Computer simulation
- ✓ Mathematical modeling
- ✓ Numerical Analysis
- ✓ Economic application

Objectives

The research has three main goals: the first one is to complete the existing dynamics system representation by making an operator theory setting for repetitive and multidimensinal system cases; the second one is to establish the new theories and to present an unified overview of all the basic system theoretic properties defined up now within the existing approaches with particular emphasis put to that of how they relate one to another; the next one is to develop the rigorous optimization theory for the considered models accompanied by the development of the corresponding computer-aided tools for their applications.
The major advantages in proposed study are expected to reach by an operator dynamics representation. This setting ensures that the results apply to a large class of systems, including continuous and sample data repetitive and $2D$ processes. It is conjectured that the extended interpretation by the unified operator setting of the given dynamics will provide the adequate accuracy of mathematical modelling to the practical technological and information processes and can be used to produce key elements of stability, stabilization and optimal control. The principal advantages of the scientific and practical value of the project are assumed to be that it provides the required framework for examination by an unified way the most important control problems. The need for the unified approach is also reinforced by rapidly growing applications areas of engineering problems known as a web-forming processes arising in emergency technologies such as biotechnology, composite materials, paper making. The obtained results will present a theoretical background for the design problem of optimal controllers in relevant basic processes and develop its basic properties which can be of interest for others purposes, too.
A key point is that the formulated problems are strongly interconnected and logically correct.
The fundamental result of the project is the development of the modern mathematical tool for studying basic structural properties of the repetitive and multidimensional processes of various nature. This tool will be accompanied by the corresponding constructive numerical algorithms of their computer realization.
The application areas of the proposed research are the industrial operations with repetitive dynamics, multidimensional filters for coding and restoration of video, photographic and tomography images, distributed transport networks and economic problems/technologies.
The end goal of the research programm is the development of numerically reliable algorithms for the synthesis of optimization based control schemes for these processes. It is conjectured that the new constructive approach will be applied/extended in consecutive order in economic, technical and information areas.

Participating in the International Conferences (selected list)

1. Dymkov M.P., Gaishun I.V. Discrete equations with varying structure and quadratic optimization problem for discrete linear Volterra equation. IV Intern. Symposium on methods and Models in Automation and Robotics (MMAR - 97), Poland, 1997, Proceedings , 1997, v.1, - pp.123-128

2. Dymkov M.P., Gaishun I.V. Stability and LQ-optimization problems for discrete Volterra equations. Proceeding of IMACS-IEEE Multiconference "Computational Engineering in Systems Applications" (CESA- 98), Tynisia. April 1-4, 1998, v.II, - pp. 264-267

3. Dymkov M.P. Feedback control problem for some linear discrete systems. Abstracts of Intern. conf. "Dynamical systems:stability, control,optimization"(DSSCO'98). Dedicated to the 80th anniversary Ye.A. Barbashin. Belarus. - Mn., 1998, Vol.1, pp. 97-98.

4. Dymkov M.P. Entire functions method for optimization problems in discrete-continuous 2-D control systems. The First Internat. Workshop on n-D systems (‚NDS'98). - Zielona Gora, Poland, 1998, - pp. 95-98.

5. Dymkov M., Gaishun I., Galkowski K. and etc. A Volterra operator approach to the stability analysis of a class of 2D linear systems. CDC-2000 Conference, Australia, 2000.

6. Dymkov M., Gaishun I. Control problems for discrete Volterra systems
Proceedings of 15-th International Symposium of Mathematical Theory of Networks and Systems (MTNS-2000), 2000, France.

7. Dymkov M., Gaishun I., Rogers E. and etc. Controllability of discrete linear repetitive processes - a Volterra Operator approach. Proceedings of 15-th International Symposium of Mathematical Theory of Networks and Systems (MTNS-2000), 2000, France.

8. Dymkov M.P., Gaishun I. V. Multipass continuous-discrete systems -Control Theory. The Second Internat. Simposium on n-D systems (‚NDS'2000). - Zielona Gora, Poland, 2000.

9. Dymkov M. P., Gaishun I. V., E. Rogers and etc. A Volterra operator based Observability theory for discrete linear repetitive processes. VI Intern. Confer. Control, Automation, Robotics and Vision. - Singapure, December, 2000

10. Dymkov M. P., Gaishun I. V., E. Rogers and etc. Stability of linear repetitive processes - a Volterra operator approach. Europein Control Congress, Porto, Portugal, September, 2001, 1410-1415.

11. Dymkov M., Gaishun I. Control structure in LQ-optimization problem for discrete 2-D repetitive processes. Proceedings CD of 1-st IFAC/IEEE Symposium on System Structure and Control, Prague, August, 2001, 6 pages.

12. Dymkov M. P., Gaishun I. V., E. Rogers and etc. On the controllability and observability properties of a class of 2D discrete linear systems. 40-th IEEE Int. Conf. on Decision and Control (CDC-2001), Florida, USA, December 2001, 3625-3630.

13. Dymkov M. P., Gaishun I. V., E. Rogers and etc. Optimal control problem for a linear repetitive processes. 16-th International Symposium of Mathematical Theory of Networks and Systems (MTNS-2002), Notre Dame, USA, 2002.

14. Dymkov M., Rogers E., Dymkou S., Galkowski K., Owens D.H. Delay System Approach to Linear Differential Repetitive Processes:Controllability and Optimization. CD ROM Proceedings of the IFAC Workshop on Time -Delay Systems (TDS- 2003), Rocquencourt, France, September, 8-10, 2003.

15. Dymkov M., Rogers E., Dymkou S., Galkowski K., Owens D.H. Controllability and Optimization for Differential Linear Repetitive Processes. Proceedings of 42-th IEEE Intern. Conference on Decision and Control (CDC- 2003), Hawai, USA, December, 2-7, 2003.

16. Dymkov M. Continuous 2-D control systems. IFAC Workshop (NDS-2005) on Multidimensional Systems and Signal Processes, Wuppertal, Germany, July, 2005, pp. 235-240.

17. Dymkov M., Rogers E., Dymkou S., Galkowski K., Owens D.H. An Approach to Controllability and Optimization Problems for repetitive processes. Proceedings of International Conference "Stability and Control Processes" (SCP-2005), 29 June – 1 July, St-Petersburg, Russia, 2005, pp. 1505-1515.

18. Dymkov M., Rogers E., Galkowski K., Dymkou S. Optimal Control of Wave Linear Repetitive Processes. International Conference on Multidimensional (nD) systems (NDS-2007), Aveiro, Portugal. ISBN 1-4244-1112-2, 2007.

19. Dymkov M., Makarevich S. Control System approach to investment and market problems. II International Conference " Mathematical modeling of social and economic dynamics "(MMSED-07), 20-22 June, Moscow, 2007.

List of publications

Full List contains over 140 papers(see on the Web-site)

Monograph:

1. Dymkov M., Extremal problems foe multidimensional control systems. Publisher House "Byelorussian State Economic University Press", 2005, 364 p.

Books:

2. Dymkov M and Astrovskii A. Higher mathematics. Textbook for economists. Publisher House "Byelorussian State Economic University Press", 2009, (in progress).

3. Dymkov M., Lipovzev V et all. Tests. Mathematics. Textbook. Publisher House "Byelorussian State Economic University Press", 2006, 275 p.

4. Dymkov M and Shilkina E. Higher mathematics. Mathematical analysis and Differential Equations. Textbook. Publisher House "Byelorussian State Economic University Press", Part II, 2005, 189 p.

5. Dymkov M.P. Entire functions methods for optimization problems in 2-D continuous-discrete control systems // In the book " Multidimensional Signals, Circuits and Systems" (Editors: K. Galkowski and J. Wood) Teylor and Francis Series, 2001, Chapter 8.

6. Dymkov M. Multicriteria optimization problems. Chapter IV (pp.258–280). In the book "Linear Programming" ,Part III. (Eds.: Gabasov R, Kirillova F.M). Minsk, Publisher House "Byelorussian State University Press". 1980. 368 p.

Visits

- June 1996, Warsaw University of Technology, Poland (invited by Prof. T. Kaczorek)
- July, 1998, Technical University of Zielona Gora, Poland (invited by Prof. K. Galkowski)

• March, October 1999, Warsaw University of Technology, Technical University of Zielona Gora, Poland (invited by Prof. T. Kaczorek and Prof. K. Galkowski)

• September, 2001 , Technical University of Zielona Gora, Poland (invited Prof. K. Galkowski, Prof. E. Rogers)

• March, 2002 , Technical University of Zielona Gora, Poland (invited Prof. K. Galkowski)

• November, 2002 , Technical University of Zielona Gora, Poland (invited Prof. K. Galkowski)

• January, 2003 — July, 2003, Research Project, Stipendium of Kassa J.Mianowski, Poland, University of Zielona Gora, Poland (coordinator Prof. K. Galkowski)

• June, 2003 , University of Southampton, UK, (invited Prof. E. Rogers)

• July, 2005 , University of Wuppertal, Germany, (invited Prof. A. Kummart)

Services to the Scientific Community

• Chair of Secretariat of the International Conference 'Dynamical systems: stability, control,optimization'. Dedicated to the 80th anniversary Ye.A. Barbashin (DSSCO'98). Belarus, Minsk, 1998.

• Member of International Program Committee of the International IFAC Workshop (NDS-2005) on Multidimensional Systems and Signal Processes, Wuppertal, Germany, July, 2005.

• Member of Organize Committee of the International Conference 'Dynamical systems: stability, control,optimization'. Dedicated to the 90th anniversary Ye.A. Barbashin (DSSCO'2008). Belarus, Minsk, September 29 — October,4, 2008.

• Reviewer for journals, projects and conferences

• Students and Ph.D. students supervision

Research Projects

• International Research project (Sponsor-Kasa J. Mianowski, Poland) "Multidimensional and Repetitive Processes", year 2003, January—July, Coordinators: Dr.Sc. M. Dymkov, Prof. K. Galkowski (University of Zielona Gora, Poland)

• International Research project (Sponsor-KBN, Poland)" Mathematical methods in a class of Two-dimensional Systems", years 2000-2001, Coordinators: Prof. K. Galkowski (Technical University of Zielona Gora), Dr.Sc. M. Dymkov (Institute of Mathematics, Belarus)

• Research Project "Multidimensional information processes in technic and economy", years, 2005-2007, Project Coordinator: Prof M. Dymkov (Sponsor: Education Ministry of Belarus)

• Research Project " Multidimensional total integrable dynamical systems", years, 1999-2005, General Project Coordinator: Academician I. Gaishun, Leader research fellow: Prof M. Dymkov (Sponsor: Ministry of Education of Belarus)

• Research Project " Nonmonotone Lyapunov functionals in distributed dynamical systems", years, 2003-2005, Project Coordinator: Prof L. Knyagische, Leader research fellow : Prof M.Dymkov (Sponsor: Research Foundation of Belarus)

• Research Project " Varieties of linear singular dynamical systems", F98-112, years, 1999-2000, Project Coordinator: Prof O. Kostyukova, Leader research fellow : Prof M.Dymkov (Sponsor: Research Foundation of Belarus)

• Research Project " Exact linearization of linear inverse problems for control dynamical systems", F95-078, years, 1999-2000, Project Coordinator: Prof V. Borukhov, Leader research fellow : Dr.Sc. M.Dymkov (Sponsor: Research Foundation of Belarus)

• Research Project " Discrete systems with varying structure", F97-111, years, 1998-1999, Project Coordinator: Prof M. Dymkov (Sponsor: Research Foundation of Belarus)

• Research Project " Nonlinear varieties of open linear and fuzzy dynamical systems ", F20-019, years, 1995-1996, Project Coordinator: Academician I. Gaishun, Leader research fellow : Dr.Sc. M.Dymkov (Sponsor: Research Foundation of Belarus)

• Research Project " Multidimensional dynamical systems ", F2-233, years, 1992-1993, Project Coordinator: Associate Academy Member I. Gaishun, Leader research fellow : M.Dymkov (Sponsor: Research Foundation of Belarus)

Current Projects

♢ Research Project " Analysis and optimization of commodity circulation in broad-making company ", 2008

Project Coordinator: Prof. M.Dymkov (Sponsor: Minsk Broad Making Company)