



***XLIX Annual
International Scientific Conference
Control Processes and Stability (CPS'18)
April 2 – 5, 2018***

PROGRAMME

April 2	10.00 – 12.00	Registration (Hall E)	
	12.00 – 13.30	Lunch	
	13.30 – 17.00	Workshop “Society, Education, Science”	Room 432
	17.00 – 19.00	Welcome party (Hall E)	
April 3	11.00	Opening Ceremony	Room 327 (the Academic Council Hall)
	11.15	Plenary Session	Room 327 (the Academic Council Hall)
		• 11.15: Aleksandr V. Krivoshein, (St. Petersburg State University, Russia)	
		“Multivariate symmetric wavelet systems”	
	12.15 – 13.30	Lunch	

April 3 – 5 Sessions

SESSION 1. MATHEMATICAL THEORY OF CONTROL PROCESSES

Ses. 1.1: April 3 13.30 – 16.00 Room 327 (the Academic Council Hall)

Session Chairs — Alexei Zhabko, Olga Chizhova (SPbSU, Russia)

1. Ageev P.V. The use of simulation software for project management
2. Alcybeev G., Yurchenko A., Kobeleva A. Application of the Kalman filter for a mathematically simulated pseudorandom sequence for imitating the device readings
3. Andriianova N.R. Analysis of the Z. Artstein algorithm for stabilization of a time-delay equation
4. Bulgakova M., Petrosyan L. One approach for the Construction of Characteristic Function in the Game with Pairwise Interactions
5. Vorobeva A.A. Conditions of diagonal stability for matrices of a special structure
6. Gorbachuk A.D. Direct Lyapunov approach to the stability analysis of differential-difference systems with constant and linearly increasing delays
7. Kazakevich D.A. Comparative analysis of methods for minimizing the sum of modules of affine functions
8. Koval N.S. The quality functional gradient computation in the discrete-time model predictive control
9. Kornilov V.Y. Dynamic adaptation of the ant algorithm using the example of the vehicle routing problem
10. Logvina I.A. Application of ordinary differential equations solvers from MATLAB for the realization of the charged balls method
11. Tokareva I.O. The motion of a spacecraft in near-Earth space with the use of the collinear libration point L1
12. Fedina A.Y. Modeling of random perturbations in the problem of motion
13. Tsimfer S.A. Transient response analysis for retarded linear systems via discretization

SESSION 2. MATHEMATICAL METHODS IN MECHANICS AND PHYSICS

Ses. 2.1: April 4 09.30 – 11.15 Room 213 D

Session Chairs — Gennadii Alferov, Dzmitry Shymanchuk (SPbSU, Russia)

1. Gorovenko P.A., Alferov G.V., Kulakov F.M. Bilateral control systems of robots
2. Kondratyuk A.S., Davydenko A.A., Starkov V.N. Controlling the flight of a spacecraft with a solar sail out of ecliptic plane
3. Korolev K.Y., Levдик V.V. Optimal damping of small oscillations by mixed criterion in the Lagrange problem
4. Kurochkin V.Y. On positional control of a space robot
5. Pomazkova G.V. The study of regular and chaotic motion in the generalized Hénon–Heiles potential applying the surface of section technique
6. Selikhova A.V., Starkov V.N., Stepenko N.A. Study of convective currents in the city atmosphere
7. Taraskina A.N. Identification areas of chaotic motion in stellar system model with central density cusp

Ses. 2.2: April 4 11.15 – 15.00 Room 204D

Session Chairs — Oleg Drivotin, Vasily Shmyrov (SPbSU, Russia)

1. Doronin G.G., Vinogradova E.M. Triode system based on a field emitter with a sharp edge modeling
2. Elaeva M.V. Calculation of the initial dimensions of a pipe under pressure under conditions of bilateral corrosion
3. Eremenko V.R. Numerical simulation of ship to ship collision
4. Kakorin N.S., Nikiforov K.A. Numerical simulation of field emission nanotriode characteristics
5. Kostyrko S.A., Kipkaev D.R. Nonlinear terms in the method of the small parameter for a plane strain problem of a solid with a nanosized surface relief
6. Lifantova E.E., Varayun' M.I., Antonov A.Y. Estimation of the IV-curve parameters with regression methods for measurement series
7. Loskutova A.D. Processing and visualization of the evaluated nuclear data files in ENDF-6 format
8. Nurtdinov D.D. The stability of a cylindrical panel under the uniform pressure
9. Pashkin V.D., Kurbatova G.I. Calculation of the dynamics of ice growth in shallow water, taking into account the dependence of the freezing temperature on the salinity of sea water
10. Petrukhin R.R., Malkova Y.V. Deformation of a plane with an elliptical hole for the John harmonic material model
11. Prokhorov I.D., Surtaeva M.N., Antonov A.Y. Use of uniform sequences for the parametric identification of the field electron emission signal
12. Sergeeva T.S. Periodic row of edge dislocations and point forces in two-component elastic medium incorporating interface stresses
13. Sokolov I.A., Strebko V.A., Nikiforov K.A. Mathematical modeling of static differential parameters of field emission micro- and nanotriodes
14. Starikova A.V., Vinogradova E.M. Multipole electrostatic system with dielectrics mathematical modeling
15. Suratov V.A., Matrosov A.V. The operators of the initial functions method for the bending of the elastic anisotropic plates problem
16. Shuvalov G.M., Kostyrko S.A. Effect of surface elasticity on reconstruction of stressed solid surface

SESSION 3. MATHEMATICAL MODELS OF MEDICAL AND BIOLOGICAL SYSTEMS

Ses. 3.1 April 05 11.15 – 13.00 Room 310

Session Chairs — Evgenii Kolpak, Elena Kotina (SPbSU, Russia)

1. Gavrilina A.V., Sokolov S.V. Analysis of the SIR-model of disease spread
2. Erilina I.I. Mathematical model of interaction of two social groups
3. Mironova P.N., Vladimirova L.V. Logistic regression construction in medicine
4. Savchenko V.A. Comparison of several methods for distance evaluation from a point to an ellipse
5. Streltsova A.A. Evaluation of compartment model parameters in positron emission tomography of the heart using the particle swarm method

SESSION 4. INFORMATION AND COMPUTER TECHNOLOGIES

Ses. 4.1 April 3 13.20 – 17.30 Room 103 E

Session Chairs — Alexander Krivtsov, Sergei Sevryukov (SPbSU, Russia)

1. Ashikhmina A.S. Semantic coherence validation in business documents
2. Eliseev P.A., Kiyayev V.I. Using a multi-agent approach for project management in a virtual company
3. Iliamakova N.Y. Extracting the most informative words for news text summarization
4. Budlov E.O. Coordinate recognition system for robot football
5. Kamia C., Klyuev V. Removing pre-installed malware applications from firmware of Android-based smartphones
6. Kito N., Klyuev V.V. News functionality for an academic Website
7. Nemoto Y., Klyuev V. Secure application development: Knockout.js vs. Ruby on Rails
8. Qiu C., Mikhailava V., Klyuev V. Comparing existing solutions for detecting fake news
9. Tarasov N. A., Blekanov I. S. Comparative analysis of the topic modeling methods in the short texts corpus analysis.
10. Kondratiuk A.N. Prototype of the service system for conducting strength calculations using the Jupyter project
11. Shaimordanov D.A. Optimization of seamless image stitching
12. Volosnikov V.I. The application of cluster analysis methods for Alzheimer's disease diagnosis
13. Rylov D., Malafeyev O.A. Software engineering principles of 2018 and 1980-2000
14. Makarov M.A., Blekanov I.S. Forecasting time series of clients by Holt–Winters method
15. Minnigareeva L.R. Improvement of the quality of search results ranking by clustering users
16. Orlov A.S., Sevryukov S.Y. YouTube captions search algorithm development
17. Papulin D.A., Smirnov A.D., Grishkin V.M., Stepanov Y.L. The method of using test control devices as a scanner of digital control and diagnostic tests
18. Papulin D.A., Smirnov A.D., Grishkin V.M., Stepanov Y.L. Behavioral models for logical elements with partially defined logic
19. Petriakov I.V. Memory allocation for parallel computation of a derivative using OpenCL technology
20. Popov N.A. Website classification with consideration of data noisiness and polythematism
21. Sen A.I. Development of pre-processing tools for screening of EOR technologies
22. Tazieva L.M. Practical implementation and modification of the path finding algorithm JPS+
23. Faustov B.A. Digital watermark detection
24. Shirobokov M.V., Kayumova D.S. Dynamical estimation of available computational power of devices in a heterogeneous network

Ses. 4.2 April 4 10.00 – 12.30 Room 327 (the Academic Council Hall)

Session Chairs — Margarita Sotnikova, Ruslan Sevostyanov (SPbSU, Russia)

1. Alieva S.M. Anomaly detection on ship movement data analysis
2. Babaeva I.V., Nikiforov K.A. Methods of analyzing the complexity of information sensitivity of computer algorithms
3. Voroshilov A.A. Application of artificial neural networks in the task of optical recognition of mathematical expressions
4. Goncharov A.V., Kirillov D.A. Deduplication in electronic document management system using machine learning techniques
5. Goncharov A.V., Kirillov D.A. Use of topic modeling to assess the performance of different departments of a company
6. Grigorev A.S. Vehicle detection in satellite images and aerial images
7. Ermolaev A.N., Kaminskij V.V., Panchenko A.D. Research of social graphs assortativity on the basis of the example of VK social network
8. Plekhanova T.M., Gromova E.V. Cooperative dynamic game on the MANET
9. Tomilova A.S. Analysis of the robust properties of the ship motion control
10. Tsimfer S.A., Rinchinov R.T. Clustering and ranking of terrain in terms of quality of walk based on public information
11. Chernyshov D.O. Calculation of the optimal number of employees and their work schedules for the Avito support department

SESSION 5 CONTROL PROBLEMS IN SOCIAL AND ECONOMICAL SYSTEMS

Ses. 5.1 April 3 13.00 – 15.00 Room 228

Session Chairs — Artem Sedakov, Yaroslavna Pankratova (SPbSU, Russia)

1. Avdeenko D.Y. Forecasting the purchasing power of the population using Markov models
2. Berdin E.M. Simulation of the vote counting scheme in the US presidential election
3. Lakhina I.E. Optimal control of advertising investments in a homogenous product market
4. Lozkins A., Bure V.M. The criterion for comparing risks of samples from different distributions
5. Marova E.V., Gromova E.V. On the characteristic of interaction of a coalition and an anti-coalition of players for cooperative differential games
6. Redinskikh N.D., Malafeyev O.A. The model of planning basic geopolitical operations with their possible support by geopolitical events
7. Ryazanova D.D. Development of an information system for automating the building of a plan of delivery and unloading component parts for the factory
8. Tomilina G.A. Modeling scenarios of the dissemination information about tax auditing over the network of taxpayers
9. Fitts S.Y. The application of the Box–Cox logarithmic transformation to the problem of forecasting the value of real estate
10. Tsvetkov A.L. Empirical models describing the proportion of people over 65 in Europe
11. Jie J., Petrosyan L. Time-consistency of Nash bargaining solution for a special class of two-stage network games
12. Sun Q., Pankratova Ya.B. One way flow two-stage network games with network formation costs

Ses. 5.2 April 5 13.50 – 16.00 Room 204 D

Session Chairs — Alexander Prasolov, Alina Boyko (SPbSU, Russia)

1. Andrusenko E.V. Dynamic models of decision-making processes
2. Boyko A.V. The construction of optimal control in the nonlinear problem of economic growth
3. GirDYuk D.V. Optimal control based on the nonlinear dynamic input-output model
4. Guseva A.M., Krylatov A.Y. Optimization of gold processing plant
5. Kaplun I.B., Khvorov A.A. Modern methods of forecasting financial time series
6. Munkhtogoo N. Analyzing the export potential of Mongolia using the apparatus of production functions
7. Ulanov A.V. Forecasting USD/RUB currency pair using radial-basis functions
8. Ustinova S.D. Distributed ledger technology in housing services and utilities
9. Fursov D.V. Imitative modeling of information impact using mass media
10. Yandovskiy P.A., Krylatov A.Y. Organization of work of smart power grid with several generators and consumers of electricity