



*L Annual
International Scientific Conference
Control Processes and Stability (CPS'19)
April 8 – 12, 2019*

PROGRAMME

April 8	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 9	10.30	Opening Ceremony	Room 327 (the Academic Council Hall)
	10.35	Plenary Session	Room 327 (the Academic Council Hall)
	• 10.35:	Alexei P. Zhabko, (St. Petersburg State University, Russia) “Current trends in the development of mathematical control theory at the faculty of applied mathematics and control processes SPbSU”	
	• 11.10:	Alexey V. Platonov, (St. Petersburg State University, Russia) “Stability analysis for nonlinear complex and hybrid systems”	
	• 11.45:	Sergei V. Pogozhev, (St. Petersburg State University, Russia) “Advanced computer technologies and their application to signal processing systems”	
	12.20 – 13.30	Lunch	

April 8 – 12 Sessions

SESSION 1. MATHEMATICAL THEORY OF CONTROL PROCESSES

Ses. 1.1: April 9 14.00 – 16.00 Room 327 (the Academic Council Hall)

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

1. Vorobeva A.A. Control of multi-agent systems with time-delay
2. Yengalych G.A., Plotkin A.V. On solving of one cubic programming problem
3. Zhigalov V.S. Test one hypothesis about the calculation of the magnitude of the overshoot in linear systems
4. Kovaleva N.O. Diagonal stability for matrices of a special structure
5. Kuchkarov I.I. Sufficient conditions for the asymptotic stability of the zero solution of one system of homogeneous differential-difference equations
6. Smol'kin Y.A. On the computation of the complex stability radius
7. Fedorova A. Comparative analysis of state estimation of lithium-ion battery using empirical and physics-based models and Kalman filter

SESSION 2. MATHEMATICAL METHODS IN MECHANICS AND PHYSICS

Ses. 2.1: April 10 09.30 – 12.00 Room 213 D

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

1. Verigina M.A., Krivovichev G.V. One-dimensional non-Newtonian mathematical model of blood flow
2. Maltseva A.S., Krivovichev G.V. Stability analysis of the two-step methods for the Cauchy problem solution based on the extended Runge - Kutta-like formula
3. Zemlyanova A.A., Kovshov A.M. The smoothing-with-amplification method for the fundamental frequency detection in digital sound recording
4. Ibraheem A. About the development of software complex for modeling and analyzing structures and buildings
5. Taraskina A.N., Raspopova N.V. The orbits in the family of triaxial models of gravitating stellar systems with quaternary equipotentials
6. Tkachenko P.S., Krivovichev G.V. Solution of the problems for one-dimensional hemodynamic equations by perturbation method
7. Fedorov V.M. Modification of the algorithm D *

Ses. 2.2: April 10 11.00 – 13.40 Room 204D

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

1. Abakarov A.M., Nikulina M.M. Computation of stress state for stretched plate with spherical surface defects
2. Doronin G.G., Vinogradova E.M. Diode field emission system with a dielectric layer modeling
3. Nikulina M.M., Abakarov A.M. The effect of corrosion on the stress state of a bent tube
4. Novgorodtcev V.A., Drivotin O.I. Gravitational Waves Radiation by a Pointlike Particle
5. Okulova D.D., Vakaeva A.B., Sedova O.S. Stress calculation in sphere with surface defects
6. Sokolov I.A., Nikiforov K.A. Mathematical modeling of current characteristics of field emission nanotriode
7. Strebko V.A., Nikiforov K.A. Electrostatic calculation of field emitter with respect to surface nanostructure
8. Chernikov E.V., Drivotin O.I. Numerical Simulation of Microcanonical Distribution
9. Shamsutdinov D.A., Kostyrko S.A. Nonlinear terms in the method of the small parameter for a plane problem of bimaterial with a nanosized interface relief
10. Shuvalov G.M., Kostyrko S.A. Nanoscale relief formation at heteroepitaxial material interface

SESSION 3. MATHEMATICAL MODELS OF MEDICAL AND BIOLOGICAL SYSTEMS

Ses. 3.1 April 8 11.15 – 13.00 Room 204D

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

1. Buzmakov G.A., Lezhnina E. Game theory in genetics. Gene's expression for Alzheimer's disease
2. Gavrilina A.V., Sokolov S.V. Application of SIR-model for predicting the incidence of HIV infection
3. Gorynya E.V. Interference and exploitation competition models
4. Gorynya E.V. Organization of assistance to cancer patients
5. Gumenyuk A.S., Zachkova A.N. Application of the method of orthogonal collocation to solving systems of differential equations
6. Eliseev Z.P. The algorithm of three-dimensional reconstruction on a cone-beam
7. Kayumova D.S., Shirobokov M.V. Recognition of coding and non-coding regions of DNA based on the optimal set of features
8. Lepsky A.I. Comparative analysis of leukocyte clustering algorithms for FS and SS parameters in cytofluorimetric blood analysis
9. Petrova O.G. Development of a russified application for processing the results of magnetic resonance imaging
10. Rasulova M.M., Khokhryakova A.A. Features of cancer in men and women in Russia
11. Frantsuzova I.S. Mathematical model of overgrowth and treatment of the breast duct
12. Khokhryakova A.A., Rasulova M.M. Features of cancer in men and women in Russia
13. Chebykina V.I. A mathematical model of the dynamics of blood glucose and insulin in patients with diabetes type one
14. Chubarov D.A. Mathematical modeling of the intervertebral disc

SESSION 4. INFORMATION AND COMPUTER TECHNOLOGIES

Ses. 4.1 April 9 13.40 – 17.30 Room 103 E

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

1. Astashenkova L.K. Method for detecting facial landmarks of a person in an image
2. Budlov E.O., Iakushkin O.O. Automated creation of unique editable textures for three-dimensional models of archaeological artifacts
3. Vasilyev V.V., Gracheva A.V., Rodionov A.I., Blekanov I.S. Graph methods of revealing semantically significant texts of court decisions
4. Hirota T., Pyshkin E. Mobile Application for Local Event Leisure Activity Recommendations
5. Endo M., Yuda K., Mozgovoy M. Developing Emotional AI with Gamygdala for Universal Fighting Engine
6. Yuda K., Endo M., Mozgovoy M. Enhancing Built-In AI of Universal Fighting Engine with Human-Like Behavior Patterns
7. Semenova E.A. The k-median problem via the Weber network construction
8. Sachkov A.V. Actuarial calculations and random interest rates
9. Volosnikov V.I., Gulyanickaya D.A. Information system for conducting and analyzing the competition for an increased state scholarship of St. Petersburg State University
10. Ezhova E.V. About reliability requirements for components of the program complex
11. Galkina N.A. Vectorization as a way to improve program performance
12. Gorbunov V.I., Gusev D.A., Kovalenko L.A., Sevryukov S.Y. Design and development of IS for the analysis of texts of court decisions
13. Kudrinskaya K.V. Automated handwriting generation
14. Menshikov M.A. An approach to storing program semantics in static program analysis
15. Mikhailov N.S. Modeling business processes in the development of a single information space
16. Mikhailova A.S. Building a thesaurus for semantic analysis of textual information
17. Moskovskaya M.D. Development of a self-learning bot for mobile game
18. Omarov R.Z. Bayesian Reinforcement Learning for content recommendations
19. Orlov A.S., Sorokina S.O., Sevryukov S.Y. Assessment of features of the modern online educational platforms in context of students actions analysis and their adaptive learning
20. Rakhmatullina E.A., Elizarova U.Y., Navolockij O.N., Dovgyallo M.V. Algorithms for the analysis of references in the texts of court decisions
21. Roshchupkina S.N. Creating the disparity map from an uncalibrated pair of images
22. Svetlov D.D. Application Development "Pedometer" on Android OS
23. Sen A.I., Krasnov F.V. Study of the stability of regularization strategies in topic modeling of texts

Ses. 4.2 April 10 11.15 – 15.15 Room 327 (the Academic Council Hall)

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

1. Alieva S.M. Analysis of the anomalies and visualization of brain MRI data
2. Alzayadi L.H. Mathematical and Computer Simulations for Nonlinear Particle Beam Systems
3. Baranov O.V., Zholobov E.V. Simulation of quadcopter emergency controlled movements
4. Belousov Y.V., Polezhaev S.A. Automatic Language Identification Using Deep Networks
5. Belousov Y.V., Polezhaev S.A. Demand prediction using machine learning methods
6. Vostrotina A.V., Bondarenko L.A. Formation of the schedule of load auto service
7. Gumeniuk D.E. Transformation of the mathematical model of a two-link robotic manipulator
8. Egorov D.A. Analysis and comparison of methods for modeling sea waves
9. Kalinin V.I., Cherniatchik R.I. Genomic data access service
10. Karpiy P.E., Kuzevanova E.G., Sergiev S.A., Kitaeva A.A. Tracking the position of a person in three-dimensional space with a single camera
11. Kosogorov O.M. Application of spline-wavelet decompositions in radar signal processing
12. Krivopolenova S.D., Goncharova A.B. Primary data analysis for building decision support system
13. Kruchinina A.A. Analysis of multichannel electroencephalographic data using Data Mining approaches
14. Larin E.S. Classifier of news using the Online LDA method
15. Lobaskin A.A., Eremin A.S. Effective implementation of explicit Runge-Kutta methods for state-dependent delay

differential equations

16. Maksudyan L.A., Golikov M.A. Supply chain system based on blockchain technology
17. Nenashev M.D. Sentiment analysis of news articles
18. Salikov V.V. Comparison of MRI preprocessing methods based on the classification results of neurodegenerative brain diseases
19. Sugonyaev A.D. Application of convolutional neural networks in the task of semantic segmentation of photos
20. Toskin N.D. Tailsitter UAV horizontal flight control
21. Tyurin K.A. Solving of a first order using a neural network
22. Schenikova S.A. Methods for analyzing AD HOC social network discussions on YouTube

SESSION 5 CONTROL PROBLEMS IN SOCIAL AND ECONOMICAL SYSTEMS

Ses. 5.1 April 9 14.00 – 17.00 Room 204D

Session Chairs — Vladimir Bure, Ekaterina Gromova, Yaroslavna Pankratova (SPbSU, Russia)

1. Bragunets V.V. Research of the family GARCH-models of volatility
2. Vorontsov A.A. On the searching of the drones locations for optimization of a network MANET performance
3. Grinikh A.L. One coalition-stable equilibrium in the finite-step game prisoner's dilemma
4. Kalugina M. Agents Importance Quantification in the Multiple-relations Network
5. Kozlov A.D., Sorokin V.A. An example of solving a game with a hierarchical structure
6. Kosyan D.A., Petrosyan L.A. About cooperative game on hypergraph
7. Magnitskaya N.G. A differential game with random discrete terminal instant
8. Redinskikh N.D., Malafeyev O.A. Investment projects through financial instruments: futures contracts
9. Serebryakova V.O. About Profit Functions of Agents in the Model of Gathering Asymmetric Information
10. Tereshchenko P.A. Stable coalition structures for a certain class of cooperative games
11. Sun F. On stability of coalition structures with constraints on players' deviations in a simple game
12. Sun P. Two-stage network formation game with heterogeneous players and private information

Ses. 5.2 April 11 11.15 – 13.40 Room 204 D

Session Chairs — Alexander Prasolov, Dmitry GirDYuk (SPbSU, Russia)

1. Gulidova A.V., Krylatov A.Y. Public transport network optimization
2. Ermolaeva P.A. Labor dynamics of different qualifications with regarding to migration
3. Kovalenko L.A. Time-Series prediction using convolutional neural networks
4. Kupinskaia A.I., Vlasova T.V. Dynamic Adaptive Tabu Search for Multi-Vehicle Pickup and Delivery Problem
5. Lozkins A. Robust hub location problem
6. Malova A.N. Optimization of production at variable prices
7. Molochkov K.I. Study of the characteristics of the teams of the National Basketball Association of the USA (NBA) using the apparatus of production functions
8. Ulyanova E.A. Calculation and parametric analysis of insurance premiums in models of short-term life insurance
9. Fursov D.V. Simulation modeling of information advancement in complex organizational systems
10. Tsybaeva A.E. Modeling of monetary policy