International Conference "Optimal Control and Differential Games" dedicated to the 110th anniversary of L. S. Pontryagin, December 12–14, 2018, Moscow, Russia Steklov Mathematical Institute of Russian Academy of Sciences, Lomonosov Moscow State University

Wednesday, December 12, 2018

8:45 – 9:15	REGISTRATION Steklov Mathematical Institute, floor 9, lobby
9:15 – 9:45	OPENING OF THE CONFERENCE Steklov Mathematical Institute, floor 9, conference hall D.V. Treschev, Yu.S. Osipov

PLENARY LECTURES

Steklov Mathematical Institute, floor 9, conference hall

Chairman	Yu. S. Osipov
9:45 – 10:35	R.V. Gamkrelidze, "History of the discovery of the Pontryagin maximum principle"
10:35 – 11:20	V.V. Kozlov, "Tensor invariants of differential equations"
11:20 – 11:40	Coffee-break
Chairman	D.V. Treschev
11:40 – 12:25	V.M. Tikhomirov, "On general principles of extremum theory"
12:25 – 13:10	A.A. Agrachev, "Homotopically visible and invisible singular extremals"
13:10 – 13:55	V. Jurdjevich, "Optimal control on Lie groups and integrable systems"
13:55 – 15:00	Lunch time

SECTIONAL TALKS

	Conference Hall	<u>Room 313</u>	<u>Room 316</u>	<u>Room 430</u>	<u>Room 530</u>
15:00 – 17:05	Optimal Control – 1	Differential Games	Optimal Control – 2	Differential Equations	Advances in Applications of Control Theory
17:05 – 17:25	Coffee-break (floor 9, lobby)				
17:25 – 19:05	Optimal Control – 1	Differential Games	Optimal Control – 2	Differential Equations	Advances in Applications of Control Theory
19:15	Welcome party (floor 9, lobby)				

Thursday, December 13, 2018

PLENARY LECTURES

Steklov Mathematical Institute, floor 9, conference hall

Chairman	A.A. Agrachev
9:00 – 9:45	A.B. Kurzhanskii, "On the dynamics of systems under the influence of high-order pulse inputs and fast controls"
9:45 – 10:30	J.P. Gauthier, "Hypoelliptic diffusion, Chu duality and human vision"
10:30 – 11:15	F.L. Chernousko, "Capsule robots: dynamics and optimal control"
11:15 – 11:30	Coffee-break
Chairman	L.A. Petrosyan
11:30 – 12:15	D.V. Treschev, "On a quantum heavy particle"
12:15 – 13:00	U. Boscain, "Geodesics and Laplacians in sub-Riemannian geometry"
13:00 – 13:15	Coffee-break
Chairman	M.I. Zelikin
13:15 – 14:00	L.A. Petrosyan, "Cooperative differential games"
14:00 – 14:45	E.I. Moiseev, D.A. Gulyaev "On the completeness of sine and cosine systems in the space of integrable functions"
14:45 – 15:30	Lunch time

SECTIONAL TALKS

	Conference Hall	<u>Room 313</u>	<u>Room 316</u>	<u>Room 430</u>	<u>Room 530</u>
15:30 – 17:35	Optimal Control	Differential Games	Differential Equations – 1	Differential Equations – 2	Advances in Applications of Control Theory
17:35 – 18:15	Coffee-break, POSTER SESSION (floor 9, lobby)				
19:00	Conference dinne	r			

Friday, December 14, 2018

PLENARY LECTURES

Steklov Mathematical Institute, floor 9, conference hall

Chairman	N.Yu. Lukoyanov
9:00 – 9:45	A.A. Davydov, "Stability of controllability of dynamic inequalities"
9:45 – 10:30	O.V. Pochinka, "Topological classification of Morse-Smale systems"
10:30 – 11:15	Yu.S. Ledyaev, "Program-predictive control for differential games"
11:15 – 11:30	Coffee-break
Chairman	A.A. Davydov
11:30 – 12:15	N.Yu. Lukoyanov, A.R.Plaksin, "Optimal guaranteed result in control problems of neutral type systems"
12:15 – 13:00	M.I. Zelikin, L.V. Lokutsievskiy, "Solutions of Newton's aerodynamic problem without axial symmetry"
13:00 – 13:15	Coffee-break
Chairman	Yu.S. Ledyaev
13:15 – 14:00	E.R. Avakov, G.G. Magaril-Il'yaev, "Maximum principle for infimum in optimal control problems"
14:00 – 14:45	Yu.G. Evtushenko, A.F. Albu, V.I. Zubov, "Fast automatic differentiation and applications"
14:45 – 15:30	Lunch time

SECTIONAL TALKS

	Conference Hall	<u>Room 316</u>	<u>Room 430</u>	<u>Room 530</u>
15:30 – 17:10	Optimal Control	Differential Equations – 1	Differential Equations – 2	Advances in Applications of Control Theory
17:10 – 17:30	Coffee-break			
17:30 – 18:45	Optimal Control	Differential Equations – 1	Differential Equations – 2	Advances in Applications of Control Theory

SECTIONAL TALKS Wednesday, December 12, 2018

Section "Optimal Control – 1" (floor 9, conference hall) December 12, 2018		
Chairman	V.M. Tikhomirov	
15:00 – 15:25	P. Mormul, "Weak and strong nilpotentizability in the monster towers hosting flag distributions"	
15:25 – 15:50	E.Le Donne, Yu.L. Sachkov, "Sub-Finsler problems on Cartan and Engel groups"	
15:50 – 16:15	M. Orieux, R. Roussarie, "Singularities of minimum time control-affine systems"	
16:15 – 16:40	D.I. Bugrov, A. M. Formalskii, "Singularities of attainability regions of systems with control bounded in absolute value or impulse"	
16:40 – 17:05	M. Tukhtasinov, <u>G.M. Abdualimova</u> , "The starting control optimization problem for the distribution of heat in the rod"	
17:05 – 17:25	Coffee-break	
Chairman	M. Orieux	
17:25 – 17:50	A.Ya. Narmanov, "On the geometry of the reachability set of vector Fields"	
17:50 – 18:15	V.S. Patsko, A.A. Fedotov, "Using Pontryagin maximum principle in constructing reachable sets for Dubins car"	
18:15 – 18:40	A.V. Podobryaev, "Symmetries in left-invariant optimal control problems"	
18:40 – 19:05	A.N. Pechen, "Pontryagin's maximum principle for control of open quantum systems"	

Section "Optimal Control – 2" (floor 3, room 316) December 12, 2018		
Chairman	V. Jurdjevich	
15:00 – 15:25	A.S. Antipin, E.V. Khoroshilova, "Lagrangian as a tool for solving linear optimal control problems with state constraints"	
15:25 – 15:50	M.V. Yanulevich, "Optimality conditions for nonconvex optimal control problem with linear system"	
15:50 – 16:15	M.I. Sumin, "Regularization of classical optimality conditions in optimal control"	
16:15 – 16:40	V.A. Dykhta, O.N. Samsonyuk, <u>S.P. Sorokin</u> , "Feedback minimum principle for continuous, discrete and impulsive optimal control problems"	
16:40 – 17:05	M.I. Gusev, "Convexity of small-time reachable sets under integral constraints on control"	
17:05 – 17:25	Coffee-break	

Chairman	M.I. Sumin
17:25 – 17:50	A.R. Danilin, <u>A.A. Shaburov</u> , "Asymptotic expansion of a solution to a singularly perturbed optimal control problem with a convex integral performance index whose terminal part depends on slow and fast variables"
17:50 – 18:15	A.M. Tarasyev, A.A. Usova, "Matrix Riccati equation in the stabilization problem of Hamiltonian systems"
18:15 – 18:40	L.A. Artemyeva, A.A. Dryazhenkov, "A Modification of the generalized residual principle when there is information on errors in weakened norms"
18:40 – 19:05	D.A. Ovsyannikov, M.A. Mizintseva, A.D. Ovsyannikov, "Joint optimization of smooth and nonsmooth functionals on beams of trajectories"

Section "Differential Equations" (floor 4, room 430) December 12, 2018		
Chairman	V.F. Butuzov	
15:00 – 15:25	S.A. Kaschenko, "The dynamics of singular pertubed models based on logistic equation with delay"	
15:25 – 15:50	V.F. Butuzov, "Singularly perturbed ODEs with multiple roots of the degenerate equation"	
15:50 – 16:15	S.D. Glyzin, A.Yu. Kolesov, N.Kh. Rozov, "Self-excited relaxation oscillations in neurosystem models"	
16:15 – 16:40	V.P. Leksin, "Solutions of triangular Schlesinger equations"	
16:40 – 17:05	A.N. Sakharov, "Classification extentions of quasi-periodic torus flows"	
17:05 – 17:25	Coffee-break	
Chairman	V.B. Vasilyev	
17:25 – 17:50	R. Grigorchuk, "On the question: «Can one hear the shape of a group?" and Hulancki type theorem for graphs»"	
17:50 – 18:15	V.B. Vasilyev, "On operators, equations and boundary value problems"	
18:15 – 18:40	A.N. Mironov, L.B. Mironova, "On the Laplace invariants for hyperbolic equations"	
18:40 – 19:05	V.B. Vasilyev, <u>R.E. Derkach</u> , O.A. Tarasova, "On a Discrete Version of Pseudo- Differential Equations"	

Section "Differential Games" (floor 3, room 313) December 12, 2018		
Chairman	M.S. Nikolskii	
15:00 – 15:25	A.G. Chentsov, "The method of programmed iterations in theory of differential games"	
15:25 – 15:50	V.I. Zhukovskiy, L.V. Smirnova, "Coefficient equilibrium criteria in a two-person differential game"	

15:50 – 16:15	S.V. Chistyakov, "Differential games of n-persons: examples and counterexamples"
16:15 – 16:40	N.N. Petrov, "To the problem of group pursuit with fractional derivatives"
16:40 – 17:05	V.I. Ukhobotov, <u>I.V. Izmest'ev</u> , "Differential games with a payoff depending on the modulus of a linear function and an integral"
17:05 – 17:25	Coffee-break
Chairman	M.S. Nikolskii
17:25 – 17:50	G.E. Ivanov, "Geometrical properties of the Minkowski operator"
17:50 – 18:15	A. A. Chikrii, "L.S. Pontryagin's first direct method. Development of ideas"
18:15 – 18:40	G.T. Chikrii, "Pontryagin's condition and it's time stretching"
18:40 – 19:05	A. Azamov, "Pontryagin's alternating integral"

Section "Advances in Applications of Control Theory" (floor 5, room 530) December 12, 2018	
Chairman	N.N. Subbotina
15:00 – 15:25	N.N. Subbotina, <u>N.G. Novoselova</u> , "On applications of Hamilton-Jacobi equations and optimal control theory to problems of chemotherapy of malignant tumors"
15:25 – 15:50	E.V. Grigorieva, N.L. Grigorenko, E.N. Khailov, "Control models of allergy treatment"
15:50 – 16:15	A.D. Klimenkova, A. Korobeinikov, E.N. Khailov, "Optimal strategies for suppressing cell division in anti-cancer therapy"
16:15 – 16:40	L.I. Rodina, "About average time profit in stochastic harvesting"
16:40 – 17:05	A.A. Fedyukov, "Stabilization of the body in the electromagnetic suspension"
17:05 – 17:25	Coffee-break
Chairman	A.S. Bortakovskii
17:25 – 17:50	V.N. Afanas'ev, <u>A.P. Presnova</u> , "A new condition for the existence and uniqueness of minimax solutions in the Hamilton-Jacobi-Bellman-Isaacs problem"
17:50 – 18:15	A.S. Bortakovskii, "Optimization of processes with switchings of models of control systems"
18:15 – 18:40	A.O. Belyakov, "On necessary optimality conditions for Ramsey-type problems"
18:40 – 19:05	V.V. Koulaguin, "Some optimal control design under uncertainty"

SECTIONAL TALKS Thursday, December 13, 2018

Section "Optimal Control" (floor 9, conference hall) December 13, 2018	
Chairman	U. Boscain
15:30 – 15:55	A.V. Dmitruk, N.P. Osmolovskii, "Variations of the v-change of time in problems with state constraints"
15:55 – 16:20	V.N. Berestovskii, "Geodesics and curvatures of left-invariant sub-Riemannian metrics on Lie groups"
16:20 – 16:45	A.A. Ardentov, "Singular trajectories in sub-Finsler problems on Cartan and Engel groups"
16:45 – 17:10	E.S. Polovinkin, "Pontryagin's direct method for optimization problems with differential inclusion"
17:10 – 17:35	L.V. Lokutsievskiy, "Convex trigonometry with applications to sub-Finsler geometry"

Section "Differential Games" (floor 3, room 313) December 13, 2018	
Chairman	M.S. Nikolskii
15:30 – 15:55	L.P. Yugay, "L.S.Pontryagin's lemma in differential evasion games"
15:55 – 16:20	V.N. Afanas'ev, N.A. Matveeva, "Uniqueness of a solution to a differential game with integral constraints"
16:20 – 16:45	M.S. Nikolskii, "On estimating the attainable set for some control objects"
16:45 – 17:10	S.S. Kumkov, "Attacker-defender-target problem as 2x1 linear differential game"
17:10 – 17:35	O. Petrosian, "Optimality conditions for differential games with continuous updating"

Section "Differential Equations – 1" (floor 3, room 316) December 13, 2018	
Chairman	T.N. Fomenko
15:30 – 15:55	T.N. Fomenko, "Homotopy and fixed points of set-valued mappings on ordered sets and some applications"
15:55 – 16:20	L.S. Efremova, "Approximate properties of C^1 -smooth Ω -stable skew products of maps of an interval"
16:20 – 16:45	V.S. Medvedev, E.V. Zhuzhoma, "Conjugacy of Smale semi-chaotic homeomorphisms and diffeomorphisms"
16:45 – 17:10	S.V. Gonchenko, "Three types of dynamics"
17:10 – 17:35	E.V. Vasileva, "Diffeomorphisms with an infinite set of stable periodic points"

Section "Differential Equations – 2" (floor 4, room 430) December 13, 2018	
Chairman	V.I. Sumin
15:30 – 15:55	V.I. Sumin, "Volterra functional equations and optimization of distributed systems"
15:55 – 16:20	V.V. Vlasov, N.A. Rautian, "Spectral analysis of Volterra integro-differential equations and its applications"
16:20 – 16:45	N.N. Nefedov, "Asimptotic method of differential inequalities and its applications in nonlinear waves theory"
16:45 – 17:10	A.D. Grekhneva, <u>V.Zh. Sakbaev</u> , "Phase flow generated by nonlinear Schroedinger equation"
17:10 – 17:35	V.V. Palin, "On the structure of solutions of the Riemann problem for one non-strictly hyperbolic system"

Section "Advances in Applications of Control Theory" (floor 5, room 530) December 13, 2018	
Chairman	M.M. Potapov
15:30 – 15:55	S.M. Orlov, N.V. Strelkovskii, "Control set smoothing method for program package elements calculation"
15:55 – 16:20	A.Yu. Vdovin, <u>S.S. Rubleva</u> , "Modification of the method of dynamic regularization of the solution of the problem of numerical differentiation, improving its characteristics"
16:20 – 16:45	A.A. Dryazhenkov, M.M. Potapov, "Numerical solution of the closed-loop boundary control problem with linear terminal set for the wave equation"
16:45 – 17:10	T.S. Zarodnyuk, A.Yu. Gornov, "Computational technologies for solving nonconvex optimal control problems with free right-hand end"
17:10 – 17:35	N.B. Melnikov, "Robustness and efficiency of parallel Fair-Taylor method in dynamic general equilibrium models"

SECTIONAL TALKS Friday, December 14, 2018

Section "Optimal Control" (floor 9, conference hall) December 14, 2018	
Chairman	G.G. Magaril-Il'yaev
15:30 – 15:55	R.V. Konstantinov, "Guaranteed result of control of differential inclusion with mixed constraint"
15:55 – 16:20	Th. Upmann, S. Behringer, "Harvesting a remote renewable resource"
16:20 – 16:45	R. Hildebrand, L.V. Lokutsievskiy, M.I. Zelikin, "Typicalness of chaotic fractal behaviour of integral vortices in Hamiltonian systems with discontinuous right-hand side"
16:45 – 17:10	Sh. Shankar, "Structurally Stable Properties of Control Systems"
17:10 – 17:30	Coffee-break
Chairman	Sh. Shankar
17:30 – 17:55	N.G. Pavlova, <u>A.O. Remizov</u> , "Singularities of geodesic flows in signature varying metrics: 2D and 3D"
17:55 – 18:20	L. Manita, M. Ronzhina, "Singular solutions for a Timoshenko beam"
18:20 – 18:45	G.A. Kurina, N.T. Hoai, "On zero order asymptotic solution of singularly perturbed linear-quadratic problems in a critical case"

Section "Differential Equations – 1" (floor 3, Room 316) December 14, 2018	
Chairman	I.V. Astashova
15:30 – 15:55	I.V. Astashova, "On asymptotic behavior of singular solutions to Emden-Fowler type differential equations"
15:55 – 16:20	V.F. Safonov, "Regularization of integral operators in singularly perturbed tasks in S.A. Lomov's method"
16:20 – 16:45	L.A. Beklaryan, A.L. Beklaryan, "A new approach to the issue of the existence of periodic and bounded solutions for functional differential equations of pointwise type and their numerical realization"
16:45 – 17:10	M.J. Mardanov, <u>Y.A. Sharifov</u> , "Existence and uniqueness of solutions for the first-order non-linear differential equations with multi-point boundary conditions"
17:10 – 17:30	Coffee-break
Chairman	M.S. Lobanov
17:30 – 17:55	M.S. Lobanov, "Algebraic spacers and the simple spectrum of the tensor products of flows"
17:55 – 18:20	V.V. Ryzhikov, "Self-similar flows, some spectral effects"
18:20 – 18:45	M.V. Korovina, "Construction of asymptotic of solutions of ordinary differential equations with holomorphic coefficients in a neighborhood of infinity"

Section "Differential Equations – 2" (floor 4, Room 430) December 14, 2018	
Chairman	A.I. Prilepko
15:30 – 15:55	A.I. Egorov, L.N. Znamenskaya, "Analysis of linear quadratic control problems of systems with distributed parameters"
15:55 – 16:20	A.I. Prilepko, "Optimal control and the maximum principle for operator equations of the first kind in Banach spaces"
16:20 – 16:45	E.A. Postnova, "Optimal control for linear dynamical systems of fractional order"
16:45 – 17:10	G.N. Averianov, Sh.H. Kutaiba, V.B. Vasilyev, "On solvability of some pseudo-differential equations"
17:10 – 17:30	Coffee-break
Chairman	G.K. Giorgadze
17:30 – 17:55	E.A. Baderko, K.V. Semenov, "Fundamental solution for one dimensional parabolic equation with a continuous coefficient"
17:55 – 18:20	G.K. Giorgadze, "Control of quantum processing based on the three-level quantum system"
18:20 – 18:45	M.N. Goncharova, "On irregular trajectories in the time optimal control problem with state constraints"

Section "Advances in Applications of Control Theory" (floor 5, Room 530) December 14, 2018	
Chairman	N.L. Grigorenko
15:30 – 15:55	I.A. Samylovskiy, "Stationarity conditions in an optimal control problem related to autonomous objects group target orbiting by carrier object"
15:55 – 16:20	A.S. Samokhin, M.A. Samokhina, "Interplanetary flight to Phobos optimization on the basis of maximum principle"
16:20 – 16:45	A.A. Galyaev, P.V. Lysenko, "Path planning of a controlled object in a problem of stealth increasing with constraints on length and curvature of trajectory"
16:45 – 17:10	N.L. Grigorenko, A.E. Rumiantcev, "To the solution of the controllability problem for one nonlinear system"
17:10 – 17:30	Coffee-break
17:30 – 17:55	O.Yu. Maryasin, "Optimal control of large buildings using a hybrid model predictive control approach"
17:55 – 18:20	L.N. Lukianova, "About the problem of controllability with state constrain"
18:20 – 18:45	P.K. Roy, S. Chakraborty, "Mathematical Study on CTL generated control Induced Delay Model for HPV Associated Cervical Cancer"

POSTER SESSION

Thursday, December 13, 2018 17:35 – 18:15, floor 9, lobby

- 1. Kh.N. Alimov, "Differential games of prosecution described by the equations of the fractional order"
- 2. A.S. Aseev, S.P. Samsonov, "Numerical solution of problem of optimization of saving in the Kaldor business cycle model"
- 3. S. Aseev, K. Besov, S. Kaniovski, "Optimal policies in the Dasgupta–Heal–Solow–Stiglitz model"
- 4. V.S. Dryuma, "On integration of nonlinear differential equations in the parametric form"
- 5. Yu.N. Kiselev, S.N. Avvakumov, "Modified Fuller problem"
- 6. Yu.N. Kiselev, M.V. Orlov, S.M. Orlov, A.P. Baklanov, "Multidimentional optimal control problems investigation with Cobb-Douglas production function"
- 7. M.S. Korzhavina, V.I. Sumin, "On the first boundary-value problem for semilinear parabolic equation with controllable principal part"
- 8. A.V. Kulevsky, "Model of nonrenewable resource extraction"
- 9. M.Sh. Mamatov, "Differential games of prosecution for the two-dimensional equation of heat conductivity with derivatives of the fractional order"
- 10. A.P. Mashtakov, "Sub-Riemannian geodesics on the group of rigid body motions"
- 11. S. Mukherjee, A.K. Roy, E. Grigorieva, E. Khailov, P.K. Roy, "A control based mathematical study on the role of regulatory T-cells in the inhibition of psoriasis using UVB exposure therapy"
- 12. S.I. Nikulin, "The problem of forming the investor public opinion within a mean field games framework"
- 13. A.I. Osinsky, "Approximate solution of a particular unstable optimal control problem"
- 14. S.S. Postnov, "l-Problem of moments for one-dimensional systems defined by integro-differential equations with Erdélyi-Kober operators"
- 15. A. E. Rassadin, "Dynamics of asymmetric top under isotropic emission of its angular momentum"
- 16. Y.L. Sachkov, E.F. Sachkova, "Abnormal trajectories in the sub-Riemannian problem with the growth vector (2,3,5,8)"
- 17. M.V. Shamolin, "Integrable variable dissipation dynamical systems"
- 18. M.B. Skopenkov, "Energy conservation in lattice field theories"
- 19. I.V. Tikhonov, Vu Nguyen Son Tung, "Superstable semigroups in nolocal problems for evolution equations"