MOTOR* 2025

XXIV International conference

Mathematical Optimization Theory and Operations Research

MOTOR 2025

July 7-11, 2025, Novosibirsk Scientific Center, Russia

Scientific Program

Novosibirsk time (GMT +7)

July, 7 Monday

9:00 – 10:00 **Registration** **House of Scientists, Small Hall**			

10:00 – 10:45 **Open Session** **House of Scientists, Small Hall**			

10:45 – 11:30 **Plenary session** Chair *M.Khachay*
Alexandr Kostochka (University of Illinois Urbana-Champaign, USA) **Equitable coloring of graphs and its variations**

11:30 – 12:00 Coffee break

12:00 – 12:45 **Plenary session**
Vassili Kolokoltsov **(**MSU, Moscow, Russia) **Stochastic modelling for fighting with invasive insects and plants**

15:00 – 16:30 NSU Block 3 room 3314	15:00 – 16:30 NSU Block 3 room 3313	15:00 – 16:30 NSU Block 3 room 3312	15:00 – 16:30 NSU Block 3 room 3307
Mathematical Programming Chair *R.Hildebrand*	**Game Theory** Chair *V.Marakulin*	**Combinatorial Optimization** Chair *Yu. Zakharova*	**Machine Learning** Chair *A.Ushakov*
V.Pirau, R.Hildebrand Numerical analysis of the convex relaxation of the barrier parameter functional of self-concordant barriers *A.Rogozin, H.Azami, A.Gasnikov, N.Nguyen* Dual Smoothing for Decentralized Optimization *G.Denisov,F. Stonyakin, M.Alkousa* **on-line** Adaptive Variants of Frank-Wolfe Method with Relative Inexact Gradient Information *A.Vyguzov, F.Stonyakin* **on-line** Frank-Wolfe Algorithm with a Decreasing Step Size for Relatively Smooth Problems	*Ya.Liu, V.Mazalov, H.Gao* Two-Stage Game Model of Opinion Dynamics *C.Zhao, J.Liu, E.Parilina* Complete-to-Sparse: A Novel Graph Construction Strategy to Increase Efficiency of ShapG *D.Kuzyutin, N.Smirnova, Ya.Pankratova On a dynamic bicriteria fish war model with fish bank* *L.Petrosyan, Ya.Pankratova* Time-Inconsistency of Cooperative Networks in Differential Games	*A.Erzin, R.Plotnikov, G.Zhukov* Approximate weighted 3-coloring *P.Emelyanov* On Junta Problem for Table-Defined Functions *Yu.Zakharova, M.Sakhno* Evolutionary Algorithm with Optimized Operators for Multi-Processor Scheduling with Resources *Yu.Zakharova, A.Zakharov* Analysis of the Pareto Set for Bi-criteria Customer Order Scheduling	*M.Okhotina, T.Gruzdeva, A.Ushakov* Distributed K-Means Semi-Supervized Clustering Using DC Optimization *I.Sharun, A.Zykina* Projection neural networks for solving equilibrium and related problems *L.Zyurikov* Applicability of Kolmogorov-Arnold networks in computer vision problems *I.Kulachenko, A.Yuskov, D.Iakubovskii, A.Melnikov* A general-purpose routing solver with natural language modeling interface

16:30 – 17:00 Coffee break			

17:00 -18:30 **Mathematical Programming** Chair *R.Hildebrand*	17:00 -18:30 **Game Theory** Chair *V.Marakulin*	17:00 -18:30 **Combinatorial Optimization** Chair *A. Nikolaev*	17:00 -18:30 **Machine Learning** Chair *A.Prolubnikov*
R.Hildebrand, R.Habib Construction of a self-concordant barrier for a quasi-polyhedral cone with infinitely many faces *A.Rogozin, A.Novitskii Decentralized Newton Method with Consensus Procedure* *V.Krutikov, E.Tovbis, L.Kazakovtsev* **on-line** Stochastic Gradient Descent Methods with Step Adaptation *D.Karamzin* **on-line** On the Study of Some Sufficient Conditions for the Existence of Regular Zeros of Quadratic Mappings	*X.Hao, V.Kochevadov, A.Sedakov* Network-Driven Partnerships in Competitive Markets *N.Knyazev, V.Gusev* Flexibility design of Tullock contest correspondence matrix *V.Gusev, Ia.Zhukov* Cyclic Potential Games *Yu.Chirkova* **(on-line)** Using Yandex Maps data to model the correspondence matrix	*A.Pyatkin* On graphs with small number of edges and maximum number of open triangles *A.Nikolaev* Evolomino is NP-complete *V.Khandeev, S.Neshchadim* On the complexity of the problem of finding two clusters with large cardinalities *R.Rudakov, D.Khachai, Yu.Ogorodnikov, M.Khachay* Branch-and-Price algorithm for the Efficient Two-Terminal Reliability Problem	*A.Prolubnikov* Parameter optimization for restarted mixed precision iterative sparse solver *A.Krylatov, A.Khrapkov, V.Mikheev* Heterogeneous graph neural networks for real-time flow assignment prediction *I.Davydov, I.Muftahov* Hybrid heuristic for a gasoline generators replenishment problem. *A.Mescheryakov, O.Khamisov* **(on-line)** A Nash Equilibrium Prediction for a Dual Market Economic System Using Machine Learning Methods

18:30 – 19:00 Tour to the University Dome			
19:00 – 22:00 Welcome Party University Hall, 3 floor in front of 3307 room			

July, 8 Tuesday

NSU   Block 3 **3 floor**   room 3307

10:00 – 10:45   Plenary session   Chair *A.Eremeev*
Saeid Alikhani   Department of Mathematics Yazd University, Yazd, Iran   **2-Restricted Optimal Pebbling Number**

10:45 – 11:30 Tutorial   Nikolai Zolotykh, Lobachevsky University of Nizhni Novgorod, Russia
How many vertices and faces can an integer linear programming polyhedron have?

11:30 – 12:00 Coffee break

12:00 – 12:45 Tutorial   room 3318 *on-line*
Igor Konnov, Kazan Federal University, Russia   **Selection of Approaches for Multi-criterial Optimization Problems**

15:00 – 16:30 NSU Block 3 room 3314	15:00 – 16:30 NSU Block 3 room 3313	15:00 – 16:30 NSU Block 3 room 3318	15:00 – 16:30 NSU Block 3 room 3307
Mathematical Programming Chair *A.Strekalovsky*	**Applications** Chair *A.Petunin*	**Operations Research** Chair *A.Eremeev*	**Machine Learning** Chair *V.Kalyagin*
A.Strekalovsky Convergency proof for a Global Search Scheme in DC optimization *B.Gompil, M.Sagaarenchen, B.Sukhee, E.Rentsen* Global optimization DC approach to quadratic nonconvex generalized Nash equilibrium problems *A.Antipin, E. Khoroshilova* **on-line** Linear-quadratic dynamic systems with control constraints *B.Ananyev* **on-line** Observation's Control Problem for Differential Equations	*A.Petunin, P.Chentsov* Algorithms for solving the Cutting Path Determination Problem based on model of the segments cutting *S.Shperling, Yu.Kochetov* A partial repacking algorithm for the irregular 2D bin packing problem *N.Shamrai* Profit Maximization and Fleet Rail Cars Management for a Large Transport Operator	*A.Eremeev* On Computational Complexity of Phased Antenna Array Synthesis Problem *Yu. Zakharova, L. Zaozerskaya* Local search based matheuristic for the assignment-type problem with loading constraints *M.Sakhno* Adaptive genetic algorithm with optimal recombination for the speed scaling scheduling problems with energy resource *H.Merrick, Ju. Memar,H. Gu* **on-line** An Improved Discrete Optimisation Procedure with comparison to Constraint Programming	*M.Abotaleb, T.Makarovskikh* BIGLDM: Innovative Forecasting of Infection Patterns with Bidirectional Generalized Least Deviation Models *A.Kolnogorov* Minimax approach to the Gaussian multi-armed bandit *A.Berezin, R.Simanchev* Diagnosis of gastrointestinal diseases using a modified greedy algorithm followed by optimization by a deep neural network *V.Kalyagin, I.Kostylev* Uncertainty of non-convex optimization algorithms for tensor graphical model selection

16:30 – 17:00 Coffee break

17:00 -18:30 **Optimal Control** Chair *A.Strekalovsky*	17:00 -18:30 **Applications** Chair *D.Arkhipov*	17:00 -18:30 **Operations Research** Chair *T. Levanova*	17:00 -18:30 **Machine Learning** Chair *V.Berikov*
A.Strekalovsky, N.Kosyanov Local Search in a Nonconvex Optimal Control Problem *A.Vasin, N.Tsyganov* **on-line** Optimal control of energy storages with self-discharge. *V.Novgorodtcev, S.Kumacheva* **on-line** On one method in stochastic optimal control problems with extremal measure *O.Samsonyuk* **on-line** A computational optimal control algorithm for impulsive processes	*D.Arkhipov, Uskov, A.Novichkov* Transport network optimization in parcel routing problem *D.Farladanskii, P.Kononova* Local search algorithm for vehicle routing problem with limited work shifts and traffic jams *D.Silaev* Evolutionary algorithms for the problem of product placement in a warehouse *A.Gorbunova* **on-line** Estimation of quantiles of the response time distribution for a fork-join queueing system	*L.Mikhailova* Segregation-Based Quasiperiodic Sequenses Recognition *T.Levanova, I.Khmara* A local search algorithm for the bi-criteria robust p-median problem *D.Aranovskii, O.Tsidulko* Uniform Capacitated Facility Location problem on caterpillar tr𝜖es *S.Nazarenko* Approximation algorithms for packing bar charts in a strip	*K.Kalmutskiy, V.Berikov* Clustering-based Graph Neural Networks in a Weakly Supervised Regression Problem *D.Chudakov, V.Berikov* Differentiable pruning by convolutional projection *V.Berikov* Black-Box Optimization under Weakly Supervised Learning Context *T.Zvonareva, O.Krivorotko* Identifiability of the inverse problem of determining the velocities for the spatial SEIR model

July, 9 Wednesday

NSU Block 3 **3 floor** room 3307

10:00 – 10:45 Plenary session Chair *A.Kazakov*

Konstantin Vorontsov MIPT, Moscow Russia **Optimization on unit simplices with applications to monotonic neural networks, non-negative matrix factorization and probabilistic topic modeling**

10:45 – 11:30 Plenary session

Yury Dorn AI Institute, MSU, Moscow, Russia **Multi-armed bandits and applications: A survey**

11:30 – 12:00 Coffee break

12:00 – 12:45 Tutorial   Andrei Vesnin *on-line* Sobolev Institute of Mathematics, Novosibirsk, Russia
Spatial graphs, their invariants and applications

15:00 – 16:30 NSU Block 3 room 3314	15:00 – 16:30 NSU Block 3 room 3313	15:00 – 16:30 NSU Block 3 room 3312	15:00 – 16:30 NSU Block 3 room 3307
Mathematical Programming Chair *O. Khamisov*	**Game Theory** Chair *A.Rettieva*	**Combinatorial Optimization** Chair *A.Kononov*	**Round table discussion «Industrial Applications»** Chair *D.Shmelkin*
Ya.Knyazkin, M.Korovkin Discrete H2-Optimal Synthesis Problem with Nonunique Solution. *S.Trifonov, L.Levin, S.Chezhegov, A.Beznosikov on-line* Incorporating Preconditioning into Accelerated Approaches: Theoretical Guarantees and Practical Improvement *O.Khamisov, O.Khamisov on-line* Distributed approach to minimal constraint relaxation in optimization with coupling constraints *M.Karafallah, F.Stonyakin, M.Alkousa on-line* Adaptive Method for Saddle Point Problems with a Generalization of Smoothness Property	*A.Rettieva* Dynamic multicriteria resource allocation games *M.Tsekot* Impact of different types of target functions on rational strategies for economic development *A.Tur, L.Petrosyan on-line* The τ-value in Cooperative Differential Games on Hypergraphs *N.Gruzdev on-line* Genetic Algorithm for Repeated Prisoner's Dilemma	*R.Simanchev, I.Urazova* An exact algorithm for maximizing the weight of a minimum dominating set in a vertex-weighted digraph *A.Totsky, R.Simanchev* On weight maximization of graph cut induced by minimal dominating set *A.Dobrynin, H.Golmohammadi* Total coalition graphs of cycles and paths *Ya.Kharchenko, A.Kononov* Improving primal-dual algorithm for the restricted parking permit problem via use of predictions	**Alexey Chernov** LLC «Quantum Algorithms And Optimization» Dolgoprudny, Russia **QORETEX solver for MILP** **Zhang Dong** Operations Research and Mathematical Optimization Lab., China **Large Scale Optimization for Complex Delivery Systems**

16:30 – 17:00 Coffee break

17:00 -18:30 **Mathematical Programming** Chair *O. Khamisov*	17:00 -18:30 **Game Theory** Chair *A.Rettieva*	17:00 -18:30 **Combinatorial Optimization** Chair *A. Kazakov*	17:00 -18:30 **Round table discussion «Industrial Applications»** Chair *D.Shmelkin*
A.Usova on-line Scattering-based stabilization technique for QSR-dissipative teleoperators with time-varying communication delays *O.Snegirev, A.Torgashov on-line* Application of quadratic programming methods in model predictive control algorithms taking into account soft limits *V.Hashimov on-line* On a Problem of Synthesis of Control of Boundary Condition and Motion of Measurement Points for Damping Oscillations of a String *D.Ibragimov, A.Mokhnacheva on-line* On the Optimality of the Guaranteeing Solution in the Time-Optimization Problem for Linear Discrete-Time Systems with Integral Control Constraints	*D.Derkach, A.Nesterov* Balancing Incentives and Efficiency via Constrained Deferred Acceptance *A.Lomakin, A.Nesterov* Detecting Bid Leakage in Procurement Auctions: A Machine Learning Approach with New Electronic Data *S.Diagilev, A.Nesterov* Reserves in Targeted Admissions: Mechanism Design Approach *A.Nesterov, O.Sviridov* Smarties and Smartypants: overconfidence in a TV-competition for young talents	*A.Lempert, A.Kazakov, D.M. Nguyen* On covering surfaces of revolution with geodetic circles *G.Bolotashvili* Extension of (m,k) facets of the linear ordering polytope *H.Golmohammadi* Some aspects of coalitions in graphs *A.Saratov, A.Lazarev, N.Lutovinova on-line* An effective algorithm for solving the scheduling problem of minimizing total tardiness on a single machine	**Anton Ushakov and Dmitry Yakubovsky** Matrosov Institute for System Dynamics and Control Theory SB RAS, Irkutsk **Automated optimization modeling with LLMs**

July, 10 Thursday

10:00 – 11:30 NSU Block 3 room 3314	10:00 – 11:30 NSU Block 3 room 3313	10:00 – 11:30 NSU Block 3 room 3312	10:00 – 11:30 NSU Block 3 room 3307
Bilevel Programming Chair *A.Orlov*	**Mathematical Economy** Chair *I.Bykadorov*	**Combinatorial Optimization** Chair *V.Il'ev*	
S.Lavlinskii Public-private partnership in the mineral resource complex: a model of a consortium of subsoil users with a conservative management company *A.Orlov, Minarchenko, T.Gruzdeva* On a Bilevel Optimization Model of Electric Power Systems with a System Operator at the Upper Level *R.Drachev, A.Panin, A.Plyasunov* Local search algorithms for competitive pricing problem *O.Khamisov* Parametric optimization approach to bilevel programming	*V.Marakulin* A Brief Proof of the Existence of an α-Core for Generalized Strategy Games *N.Aizenberg* **on-line** Cooperative behavior of prosumers and their interaction with the centralized part of the energy system *I.Bykadorov* Trade of several countries under Monopolistic Competition Model: autarky under different situations of pre-autarky *A.Shchiptsova* Global Phosphate Market: A Spatially Distributed Model	*I.Vasilyev, T.Gruzdeva, D.Boyarkin, A.Ushakov* NPU-Accelerated K-means and K-medoids Clustering Algorithms *V.Il'ev* An Approximation Algorithm for a Cluster Editing Problem with Limitation on Size of Clusters *D.Musatov, S.Vasilchishin* Fair chore division of a tree *A.Chirkov, S.Veselov, N.Zolotykh* On the upper bound of edges in a corner polyhedron.	
11:30 – 12:00 Coffee break		
12:00 -13:30 **Bilevel Programming** Chair *A.Orlov*	12:00 -13:30 **Applications** Chair *O.Sukhoroslov*	12:00 -13:30 **Operations Research** Chair *V.Kartak*	
A.Panin, A.Plyasunov A bilevel facility delocation problem *S.Utyupin, A.Melnikov, V.Beresnev* Computational complexity of one step and heuristics for the Eternal Vertex Cover Problem *A.Melnikov, V.Beresnev* Additional constraints for computing upper bounds for (r|p)-centroid problem's objective function	*Yu.Semenov, O.Sukhoroslov* MIP Models and Complexity Results for DAG Scheduling in the Cloud *E.Ushakova* Pricing and informative advertising in two-sided markets on the plane *O.Khamisov, S.Gakg* Dantzig-Wolfe decomposition in CANOE model *I.Minarchenko, O.Khamisov* Determining network equilibrium under transmission capacity constraints	*V.Zinov, V.Kartak, Yu.Valiakhmetova* Holes processing in Voronoi diagram with rectangular sites for the slab's deformations comparative analysis *B.Gavrish, Yu.Kochetov* A column generation heuristic for a petrol station replenishment problem with complex unloading rules *A.Yuskov, I.Kulachenko, Yu.Kochetov* Hybrid memetic algorithm for the pickup and deilvery problem with time windows *K.Lukmanova,V. Kartak, A.Ripatti* Intelligent methods for optimizing fuel delivery routes to gas stations	

NSU   Block 3 **3 floor**   room 3307
15:00 – 15:45   Plenary session   *on-line* Chair *A.Kononov* Panos M. Pardalos University of Florida, USA   **Computational Approaches for Solving General Systems of Nonlinear Equations**
15:45 – 16:30 Plenary session *on-line* Guochuan Zhang   Zhejiang University, Hangzhou, China **Interdiction: A bilevel combinatorial optimization problem**
16:30 – 17:00 Coffee break
17:00 – 17:45 Plenary session *on-line* Eduardo Uchoa   Universidade Federal Fluminense, Brazil   **Optimizing with Column Generation**
19:00 – 22:00 Banquet Restaurant in House of Scientists

July, 11   Friday

10:00 – 11:30 NSU Block 3 room 3314	10:00 – 11:30 NSU Block 3 room 3313	10:00 – 11:30 NSU Block 3 room 3312	10:00 – 11:30 NSU Block 3 room 3307
	Applications Chair *F.Pisnichenko*	**Operations Research** Chair *A.Erzin*	**Round table discussion** Chair *I.Vasilyev*
	K.Semenikhin Multivariate Selberg Probability Bound in Distributionally Robust Optimization with Statistical Applications *N.Kovrizhnykh, F.Pisnichenko* Light-Weight MILP Solver for Real-Time Optimization on Embedded Devices *F.Pisnichenko* Efficient Nonlinear Least Squares Solver for Real-Time Applications *M.Titova, F.Pisnichenko, N.Kovrizhnykh* An Efficient Interior-Point Solver for QPs and LPs problems	*A.Erzin, A.Shadrina* Optimal placement of mobile distance-limited devices for line routing *Ed.Gimadi, E.Goncharov* On a Polynomial Approximation Algorithm for the Uncapacitated Facility Location Problem *E.Goncharov* Bi-population genetic algorithm for the resource-constrained project scheduling problem *V.Servakh, A.Romanova* Minimizing the makespan in a single-machine scheduling problem with deadlines and setup times	**The second round** **of the Challenge Competition**

11:30 – 12:00 Coffee break			
12:00 -13:30 **Mathematical Programming** Chair *A.Strekalovsky*	12:00 -13:30 **Applications** Chair *I.Davydov*	12:00 -13:30 **Operations Research** Chair *I.Samoylenko*	12:00 -13:30 **Round table discussion** Chair *I.Vasilyev*
M.Barkova, A.Strekalovsky Global Search in DC Optimization Problem with Quadratic Data *V. Hashimov, K. Aida-zade* **on-line** The Problem of Synthesis of Control of Movement of State Sensors and Power of Heating Sources of the Rod with Optimization of Their Placement *A.Timofeeva,T. Avdeenko* Optimal collapsing levels in one-way ANOVA: agglomerative merging algorithms and mixed integer linear programming *A.Zhulev, L.Sokolinsky* **on-line** On new method of linear programming using artificial neural network	*T.Makarovskikh, M.Sallam* Methods for reducing the complexity of calculating critical functions when solving antenna placement problems using brute force algorithm *S.Malakh, V.Servakh* The upper bound of net present value for problem of planning investment projects *I.Davydov, A.Lyapin* Variable neighborhood search approach for additional education school timetabling *A.Zykina, V.Munko, E.Shikin* Digital Service for Preparation of Documentation	*E.Musatova, A.Lazarev* A branch-and-bound algorithm for solving the single-machine problem of minimizing external resources costs *P.Borisovsky, A.Gette* A simulation-optimization approach to solving the chance-constrained bin packing problem *I.Samoylenko, F.Ozhegov* Guaranteed under failures distance as the tool for resilience facility location problem *B.Kornitskii, K.Baikov, A.Melnikov* Approximate algorithm for multi-criteria optimization models with implicitly defined functions	**The second round** **of the Challenge Competition**

15:00 -16:20 **Mathematical Programming** Chair *A.Strekalovsky*	15:00 -16:20 **Game Theory** Chair *V.Mazalov*	15:00 -16:20 **Combinatorial Optimization** Chair *A.Melnikov*	15:00 -16:20
R.Yarullin, I.Zabotin, O.Shulgina **on-line** A Variant of the Successive Concessions Method and Its Implementation based on Cutting Procedures *V.Voronov, A.Neopryatnaya* **on-line** On Continuous Embeddings of 2-trees in a Sphere	*N.Obrosova, A.Shananin, A.Spiridonov* **on-line** Labor demand analysis in production networks with substitution of inputs *N.Trusov, A.Shananin* **on-line** Mathematical model of the interest rate influence on the repayment of the credit debt	*V.Kazakovtsev, S.Muravyov, I.Usov* **on-line** A New Approach to the Application of Clustering Methods for Multimodal Data *S.Gladyshev, D.Musatova* **on-line** Heuristic "safe jobs first" for stochastic single machine scheduling problem	

V.Zorkaltsev, V.Erokhin, G.Tamasyan **on-line** History and Prospects of the Interior Point Algorithms *V.Erokhin, G.Tamasyan, N.Stepenko* **on-line** Fast Fej´er type algorithm for finding a nonnegative solution to a system of linear algebraic equations	*A.Grinikh* **on-line** About Time-Consistency of the Cooperative Solution for n-Person Prisoner's Dilemma on a Hypergraph	*M.Vodyan* **on-line** Greedy algorithms for finding upper bounds on the temporal bin packing problem with failure domains *S.Uvarov* **on-line** Clause Learning for Hard Random 3-CNF Formulas	

16:30 – 17:00 Coffee break

17:00 -18:00   NSU, Block 3, 3 floor, room 3307   Closing Session