2019

12th International Conference

COMPUTER DATA ANALYSIS AND MODELING:

STOCHASTICS AND DATA SCIENCE

PROGRAM

Belarusian State University

September 18–22, 2019

Minsk, BELARUS

Conference Schedule

Wednesday		**September 18**
8.00–20.00	Registration	
15.00–19.00	Walking city tours	
Thursday		**September 19**
8.00–20.00	Registration	
9.00–9.30	Opening ceremony	
9.30–13.30	Plenary session	
14.30–18.00	Contributed sessions	
19.00	Conference Party	
Friday		**September 20**
9.00–13.30	Plenary session	
14.30–18.00	Contributed sessions	
19.00	Bolshoi Theater of Belarus: “Swan Lake”	
Saturday		**September 21**
9.00–12.30	Plenary session	
12.30–12.40	Closing the Conference	
14.00-20.00	Excursions	
Sunday	Departure	**September 22**

Time and Place of Sessions

Room	**R0**	**R1**	**R2**	**R3**
Time	**9.00–13.30**	**14.30–18.00**	**14.30–18.00**	**14.30–18.00**
Sep.19	**O, I**	**C1**	**C2**	**C3**
Sep.20	**I**	**C4**	**C5**	**C6**
Sep.21	**P (till 12.30), C**			

O – *Opening,* **C** – *Closing,* **I** – *Invited Plenary,* **P** – *Plenary,*
C1–C6 – *Contributed sessions*

The Conference events will be held on the university campus:
Registration, Plenary (September 20) and all Contributed Sessions – in the building of the Faculty of Physics (Bobruyskaya St., 5); Opening, Closing of the Conference and Plenary Sessions (September 19, 21) – in the Red Building (Bobruyskaya St., 5a).

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Scientific program

Thursday, September 19

Room R0, Conference hall,
Red Building (Bobruyskaya St., 5a), 2nd floor

Time	Chair: Prof. Yu. Kharin	Invited Plenary Session
9.00–9.30		**Opening Ceremony**
9.30–10.00	A. Gammerman	CONFORMAL PREDICTION FOR RELIABLE MACHINE LEARNING
10.00–10.30	N. Lietzen, J. Virta, K. Nordhausen, P. Ilmonen	MINIMUM DISTANCE INDEX FOR NON-SQUARE COMPLEX VALUED MIXING MATRICES
10.30–11.00	P.J.F. Groenen, J.J. van den Burg	MULTICLASS SUPPORT VECTOR MACHINES WITH GENSVM
		11.00–11.30 Coffee Break
Time	**Chair: Prof. P. Filzmoser**	
11.30–12.00	T. Kollo, D.von Rosen, M. Valge	TESTING STRUCTURE OF THE COVARIANCE MATRIX: A NON-NORMAL APPROACH
12.00–12.30	G. Shevlyakov, I. Shirokov, A. Mamina, V. Litvinova	ROBUST QN-ESTIMATOR OF SCALE AND ITS FAST HIGHLY EFFICIENT ANALOGUES
12.30–13.00	A. Duerre, R. Fried	DETECTING CHANGES IN THE DEPENDENCE STRUCTURE OF A TIME SERIES
13.00–13.30	Yu.S. Kharin	DISCRETE-VALUED TIME SERIES ANALYSIS BY PARSIMONIOUS HIGH-ORDER MARKOV CHAINS
		13.30–14.30 Lunch Break

14.30–18.00 **Contributed Sessions**

Room R1 **(418)**
the building of the Faculty of Physics (Bobruyskaya St., 5)

Session C1		Robust and Multivariate Data Analysis
Time	**Chair: Prof. A.Yu. Kharin**	
14.30–14.50	A.Yu. Kharin, Ton That Tu	PERFORMANCE AND ROBUSTNESS IN SEQUENTIAL TESTING OF HYPOTHESES
14.50–15.10	D. Miksova, C. Rieser, P. Filzmoser	IDENTIFICATION OF MINERALIZATION IN GEOCHEMISTRY BASED ON THE SPATIAL CURVATURE OF LOG-RATIOS

15.10–15.30	M. Karaliute, K. Ducinskas, L. Saltyte-Vaisiauske	EXPECTED ERROR RATE IN LINEAR DISCRIMINATION OF BALANCED SPATIAL GAUSSIAN TIME SERIES
15.30–15.50	E. Zikariene, K. Duchinskas	IMPLEMENTATION OF GENERALIZED ADDITIVE MODELS FOR SPATIAL BETA REGRESSION
		15.50–16.20 Coffee Break
Time	**Chair: A. Kostogryzov**	
16.20–16.40	A. Kostogryzov, A. Nistratov, G. Nistratov	PROBABILISTIC DATA ANALYSIS FOR PREDICTING MEAN TIME BEFORE CRITICAL INTEGRITY LOSSES OF COMPLEX SYSTEM WHEN EXPLICIT QUANTITATIVE REQUIREMENTS TO INTEGRITY ARE NOT SPECIFIED
16.40–17.00	M. Radavicius	STRUCTURAL DISTRIBUTION ESTIMATION
17.00–17.20	E.E. Zhuk	PRINCIPLE COMPONENTS METHOD IN STATISTICAL CLASSIFICATION AND ITS EFFICIENCY
17.20–17.40	V.S. Mukha, N.F. Kako	INTEGRALS RELATED TO THE MULTIDIMENSIONAL-MATRIX GAUSSIAN DISTRIBUTION
17.40–18.00	A.V. Medvedev, A. Tereshina D.I. Yareshenko	NONPARAMETRIC MODELLING OF MULTIDIMENSIONAL MEMORYLESS PROCESSES

Room R2 **(321)**

the building of the Faculty of Physics (Bobruyskaya St., 5)

Session C2		Asymptotic Methods in Stochastics
Time	**Chair: Prof. K. Kubilius**	
14.30–14.50	A.D. Egorov, A.V. Zherelo	APPROXIMATE FORMULAS FOR EXPECTATION OF FUNCTIONALS FROM SOLUTION TO LINEAR SKOROHOD STOCHASTIC DIFFERENTIAL EQUATION
14.50–15.10	L.A. Yanovich, M.V. Ignatenko	SOME FORMULAS OF OPERATOR INTERPOLATION ON THE SET OF RANDOM PROCESSES
15.10–15.30	A.A. Levakov, M.M. Vaskouski, I.V. Kachan	ASYMPTOTIC EXPANSIONS OF SOLUTIONS OF MIXED TYPE SDE DRIVEN BY FRACTIONAL BROWNIAN MOTIONS FOR SMALL TIMES
15.30–15.50	T.V. Tsekhavaya, N.N. Troush	INTERNALLY HOMOGENEOUS RANDOM FIELDS ANALYSIS
		15.50–16.20 Coffee Break
Time	**Chair: Prof. K. Duchinskas**	
16.20–16.40	I. Dermenzhy, G. Vostrov	PROBABILISTIC APPROACH IN FACTORIZATION BY ELLIPTIC CURVE METHOD
16.40–17.00	G. Vostrov, O. Ponomarenko	STOCHASTIC ANALYSIS OF THE SMOOTH NUMBER PROPERTIES AND THEIR SEARCH
17.00–17.20	A. Abdushukurov	ESTIMATION OF CONDITIONAL SURVIVAL FUNCTION UNDER DEPENDENT RANDOM CENSORED DATA
17.20–17.40	V.A. Voloshko,	ON SOME UPPER BOUNDS FOR NONCENTRAL

	E.V. Vecherko	CHI-SQUARE CDF
17.40–18.00	D.G. Zakhidov, D.Kh. Iskandarov	EMPIRICAL LIKELIHOOD CONFIDENCE INTERVALS FOR CENSORED INTEGRAL

Room R3 **(219)**

the building of the Faculty of Physics (Bobruyskaya St., 5)

Session C3		**Econometric Modeling and Survey Analysis**
Time	**Chair: Prof. V. Malugin**	
14.30–14.50	I. Belovas	MODELING BALTIC MARKET INDICES: A COMPARISON OF MODELS
14.50–15.10	N. Bokun	TOURISM IN BELARUS: INDICATORS, SATELLITE ACCOUNT AND SURVEYS
15.10–15.30	S.S. Lohvinenko	STATISTICAL PROPERTIES OF PARAMETER ESTIMATORS IN THE FRACTIONAL VASICEK MODEL
15.30–15.50	S.E. Vorobeychikov, Yu.B. Burkatovskaya	NON-ASYMPTOTIC CONFIDENCE ESTIMATION OF THE AUTOREGRESSIVE PARAMETER IN AR(1) PROCESS WITH AN UNKNOWN NOISE VARIANCE
		15.50–16.20 Coffee Break
16.20–16.40	L.A. Soshnikava	ADAPTIVE METHODS FOR FORECASTING CURRENCY COURSES
16.40–17.00	A.Yu. Novopoltsev	USING CREDIT HISTORY DATA TO MONITOR FINANCIAL STABILITY OF THE BELARUSIAN ECONOMY
17.00–17.20	E.A. Poleshchuk	PROBLEMS OF THE FORMATION OF THE SYSTEM OF ENVIRONMENTAL-ECONOMIC ACCOUNTING
17.20–17.40	V. I. Nikitionak, S.S. Vetokhin, A.M. Bakhar, E.V. Tereshko	COMPARATIVE ANALYSIS OF OPTIMAL ALGORITHMS TREATMENT OF STATIONARY PUISSON FLUXES
17.40–18.00	N.M. Zuev	A FORMULA FOR EUROPEAN OPTIONS COSTS CALCULATION

Friday, September 20

Room R0 **(418)**

the building of the Faculty of Physics (Bobruyskaya St., 5)

Time	Chair: Prof. T. Kollo	Invited Plenary Session
9.00–9.30	G. Dzemyda, M. Sabaliauskas	NEW METHOD TO MINIMIZE THE STRESS IN MULTIDIMENSIONAL SCALING
9.30–10.00	J. Machalova, R. Talska, K.Hron	APPROXIMATION OF DENSITY FUNCTIONS USING SIMPLICIAL SPLINES
10.00–10.30	P. Li, T. Maiti	FUNCTIONAL GRAPHICAL MODEL CLASSIFICATION
10.30–11.00	E. Stoimenova	ON THE UPPER BOUND OF THE RISK IN SELECTION OF THE T BEST ITEMS
		11.00–11.30 Coffee Break

Time	Chair: Prof. A. Duerre	
11.30–12.00	E. Orsingher	SOME RESULTS ON THE BROWNIAN MEANDER
12.00–12.30	K. Kubilius	HURST PARAMETER ESTIMATION IN FRACTIONAL DIFFUSION MODELS
12.30–13.00	S. Datta	A RANDOM GRAPH GENERATION MODEL FOR TRANSCRIPTION NETWORK AND NONPARAMETRIC SIMULATOR FOR RNA-SEQ EXPRESSION DATA
13.00–13.30	V.I. Malugin, A.Yu. Novopoltsev, N.V. Hryn	ANALYSIS OF FINANCIAL STABILITY OF THE BELARUSIAN ECONOMY BASED ON MICRODATA AND EXPERT INFORMATION
		13.30–14.30 Lunch Break

14.30–18.00 **Contributed Sessions**

Room R1 **(215)**

the building of the Faculty of Physics (Bobruyskaya St., 5)

Session C4		Computer Simulation of Stochastic Systems
Time	**Chair: Prof. A. Gammerman**	
14.30–14.50	A.V. Zorine	REGENERATIVE SIMULATION OF TIME-SHARING QUEUEING SYSTEM IN RANDOM ENVIRONMENT
14.50–15.10	S. Minkevicius	FLUID LIMITS FOR THE WAITING TIME OF A CUSTOMER IN MULTIPHASE QUEUES
15.10–15.30	A.V. Kolchin, H.G. Ionkina	ON SOME NEW ASPECTS IN ACQUISITION AND ANALYSIS OF BRAIN ELECTRICAL ACTIVITY
15.30–15.50	A. Hubin, G. Storvik, P. Grini, M. Butenko	BAYESIAN BINOMIAL REGRESSION MODEL WITH A LATENT GAUSSIAN FIELD FOR ANALYSIS OF EPIGENETIC DATA

		15.50–16.20 Coffee Break
Time	**Chair: Prof. M. Radavicius**	
16.20–16.40	D. Kopats, M.A. Matalytski	APPLICATION OF OPEN MARKOV NETWORK WITH VARIOUS FEATURES AT MODELING REALLY OBJECTS
16.40–17.00	M.A. Fedotkin, E.V. Kudryavtsev	SIMULATION OF ADAPTIVE CONTROL SYSTEM WITH CONFLICT FLOWS OF NON-HOMOGENEOUS REQUESTS
17.00–17.20	V.A. Podolskiy, Ya.A. Turovskiy, A.V.Alekseev, A.I. Michalski;	USE OF VARIABILITY OF THE HEART RHYTHM FOR PREDICTING THE SUCCESS OF THE OPERATOR'S WORK WHEN USING HUMAN-MACHINE INTERFACES
17.20–17.40	E.D. Mihov	FINDING SIGNIFICANT VARIABLES IN THE PROBLEMS OF MODELLING LESS MEMORY PROCESSES
17.40–18.00	M.E. Kornet, A.V.Medvedev, E.D. Mihov	ABOUT THE PROCESSES IN THE CHANGING FRACTIONAL DIMENSION SPACE

Room R2 **(321)**

the building of the Faculty of Physics (Bobruyskaya St., 5)

Session C5		**Data Science: Methods, Algorithms and Software**
Time	**Chairs: P.J.F. Groenen**	
14.30–14.50	E. Mangalova, O. Chubarova, D. Melekh	INFLUENCE OF THE TRAINING SET ON THE PREDICTION STABILITY IN ESTIMATION OF ACUTE PANCREATITIS SEVERITY
14.50–15.10	A. Hubin, G. Storvik	COMBINING MODEL AND PARAMETER UNCERTAINTY IN BAYESIAN NEURAL NETWORKS
15.10–15.30	G. Navickas, G. Korvel, J. Bernataviciene	OVERVIEW OF SPEECH SYNTHESIS USING LSTM NEURAL NETWORKS
15.30–15.50	J. Venskus, P. Treigys	METEOROLOGICAL DATA INUENCE ON MISSING VESSEL TYPE DETECTION USING DEEP MULTI-STACKED LSTM NEURAL NETWORK
		15.50–16.20 Coffee Break
Time	**Chair: Prof. G. Shevlyakov**	
16.20–16.40	M.S. Abramovich, V.V. Kozlovsky, V.Stelmashok O.L. Polonetsky	PREDICTING THE SUCCESS OF ANTEGRADE CHRONIC TOTAL OCCLUSION RECANALIZATION USING MACHINE LEARNING
16.40–17.00	I.E. Starodubtsev, Yu.S. Kharin,	STATISTICAL CLASSIFICATION OF THE STATES OF BIOLOGICAL CELLS TREATED WITH CARBON NANOTUBES BASED ON AFM-IMAGES OF CELL SURFACE
17.00–17.20	V.V. Krasnoproshin, V.V. Matskevich	STATISTICAL APPROACH TO IMAGE COMPRESSION BASED ON A RESTRICTED BOLTZMANN MACHINE

17.20–17.40	V.A. Kulyukin, S. Mukherjee, P. Vats, A. Tiwari, Y.B. Burkatovskaya	CLASSIFICATION OF MOTION REGIONS WITH CONVOLUTIONAL NETWORKS, SUPPORT VECTOR MACHINES, AND RANDOM FORESTS IN VIDEO-BASED ANALYSIS OF BEE TRAFFIC

Room R3 **(219)**

the building of the Faculty of Physics (Bobruyskaya St., 5)

Session C6	**Statistical Analysis of Discrete Data**	
Time	**Chair: Prof. A.M. Zubkov**	
14.30–14.50	A.M. Zubkov, V.I. Kruglov	NUMBER OF PAIRS OF IDENTICALLY MARKED TEMPLATES IN Q-ARY TREE
14.50–15.10	G. Vostrov, R. Opiata	A GENERALIZED PROBABILISTIC MODEL OF COMPUTER PROOF OF THE ARTIN HYPOTHESIS
15.10–15.30	M.P. Savelov	A SET OF ASYMPTOTICALLY INDEPENDENT STATISTICS OF POLYNOMIAL FREQUENCIES CONTAINING THE PEARSON STATISTIC
15.30–15.50	A.A. Serov, A.M. Zubkov	TESTING THE NIST STATISTICAL TEST SUITE ON ARTIFICIAL PSEUDORANDOM SEQUENCES
		15.50–16.20 Coffee Break
16.20–16.40	Yu.S. Kharin, O.V. Dernakova	ON STATISTICAL ESTIMATION OF TRANSITION PROBABILITIES MATRIX FOR MARKOV CHAIN UNDER INCOMPLETE OBSERVATIONS
16.40–17.00	M. Kislach, Yu.S. Kharin	STATISTICAL ANALYSIS OF COUNT CONDITIONALLY NONLINEAR AUTOREGRESSIVE TIME SERIES BY FREQUENCIES-BASED ESTIMATORS
17.00–17.20	I.A. Badziahin	ON PARAMETER ESTIMATION OF DOUBLE-CENSORED STATIONARY GAUSSIAN TIME SERIES

Saturday, September 21

Room R0, Conference hall,

Red Building (Bobruyskaya St., 5a), 2nd floor

Time	Chair: Prof. G. Dzemyda	Plenary Session
9.00–9.30	P. Filzmoser, S. Brodinova, T. Ortner, C. Breitender, M.Rohm	ROBUST AND SPARSE K-MEANS CLUSTERING FOR HIGH-DIMENSIONAL DATA
9.30–10.00	A. Barbiero	INDUCING A TARGET ASSOCIATION BETWEEN ORDINAL VARIABLES BY USING A PARAMETRIC COPULA FAMILY
10.00–10.30	L.M. Sakhno	INVESTIGATION OF CONDITIONS FOR ASYMPTOTIC NORMALITY OF SPECTRAL ESTIMATES
		10.30–11.00 Coffee Break

Time	Chair: Prof. Yu. Kharin	
11.00–11.30	A.M. Zubkov	RECENT RESULTS ON THE TOTAL VARIATION DISTANCE
11.30–12.00	K. Duchinskas, L. Dreiziene	SPATIAL MODEL SELECTION BASED ON HYBRID PERFORMANCE MEASURE OF LINEAR CLASSIFIER
12.00–12.30	R N. Rattihalli, M. Raghunath	POWER SKEW SYMMETRIC DISTRIBUTIONS: TESTS FOR SYMMETRY
12.30		**Closing of the Conference**