

Olomoucian Days of Applied Mathematics
ODAM²⁰₂₃ 
12 - 14 June



Faculty of Science, Palacký University Olomouc
17. listopadu 12, Olomouc, 771 46

Scientific program
June 12 – June 14, 2023

Monday June 12 (12:45 – 18:55)

11:30 – 13:00 Registration

12:45 – 12:55 Opening (room 5.007)

13:00 – 14:20 Outlier detection methods (room 5.007)

Chair: Peter Filzmoser

13:00 – 13:20 Patricia Puchhammer, Peter Filzmoser

Detecting Local Outliers Using the Spatially Smoothed MRCD Estimator

13:20 – 13:40 Marcus Mayrhofer, Peter Filzmoser

Explainable Multivariate Outlier Detection Based on Shapley Values

13:40 – 14:00 Jeremy Oguamalam, Una Radojičić, Peter Filzmoser

Minimum Regularized Covariance Trace Estimator and Outlier Detection for Functional Data

14:00 – 14:20 Ondřej Vencálek, Daniel Hlubinka, Stanislav Nagy

Depth-based Detection and Classification of Outliers for Functional Data

13:00 – 14:20 Gao beam and elastic problems (room 5.008)

Chair: Rostislav Vodák

13:00 – 13:20 Horymír Netuka, Jitka Machalová

Gao Beam: Thirteen Years After

13:20 – 13:40 Jitka Machalová, Horymír Netuka

Buckling of the Gao Beam

13:40 – 14:00 Jana Radová, Jitka Machalová

Parameter Identification for Gao Beam and Foundation

14:00 – 14:20 Igor Bock

On Dynamic Contact Problems for Viscoelastic and Elastic Plates

14:30 – 15:50	Compositional data analysis I (room 5.007) Chair: Eva Fišerová
14:30 – 14:50	Paulína Jašková , Matthias Templ, Karel Hron, Javier Palarea-Albaladejo <i>Sparse Pairwise Logratio Variable Selection for High-dimensional Compositional Data</i>
14:50 – 15:10	Viktorie Nesrstová , Ines Wilms, Karel Hron, Peter Filzmoser <i>Identification of Important Pairwise Logratios in Compositional Data Employing Sparse Principal Component Analysis</i>
15:10 – 15:30	Peter Filzmoser , Gianna S. Monti <i>A Robust Knockoff Filter for Sparse Regression with Microbiome Compositions</i>
15:30 – 15:50	Kamila Fačevicová , Viktorie Nesrstová, Paulína Jašková, Karel Hron, Jana Pelclová, Aleš Gába <i>Analysis of Two-way Compositions Based on the Elemental Information</i>
14:30 – 15:30	Models, equations & computations I (room 5.008) Chair: Jitka Machalová
14:30 – 14:50	Ctirad Matonoha , Štěpán Papáček <i>Bohl-Marek Formulation of the Nonlinear System of ODEs for a Class of Mathematical Models With Conservation Laws</i>
14:50 – 15:10	Štěpán Papáček , Ctirad Matonoha, Arturo Sanchez <i>On the D-QSSA Method With Optimal Constant Delays Applied to a Class of Mathematical Models</i>
15:10 – 15:30	Monika Syga , Ewa Bednarczuk <i>Lagrangian Duality for Nonconvex Optimization Problems</i>
15:50 – 16:20	Coffee break
16:20 – 17:20	Compositional data analysis II (room 5.007) Chair: Zdeněk Hlávka
16:20 – 16:40	Ivana Pavlů , Jitka Machalová, Raimon Tolosana-Delgado, Karel Hron, Karl Gerald van den Boogaart <i>Distributional Principal Component Analysis With Application to Particle Size Distributions</i>
16:40 – 17:00	Stanislav Škorňa , Jana Burkotová, Karel Hron, Jitka Machalová <i>Bivariate Compositional Splines for Representation of Density Functions</i>
17:00 – 17:20	Karel Hron , Christian Genest, Johanna G. Nešlehová <i>Orthogonal Decomposition of Multivariate Densities in Bayes Spaces with Application to Functional Data Analysis</i>
16:20 – 17:00	Models, equations & computations II (room 5.008) Chair: Štěpán Papáček
16:20 – 16:40	Olga Karelkina <i>Combinatorial Optimization Models of RNA Structural Motifs</i>
16:40 – 17:00	Ewa Bednarczuk , Ignacy Kaliszewski, Janusz Miroforidis <i>Solving Multiple-choice Knapsack Problems by Multi-objectivization and Chebyshev Scalarization</i>

17:30 – 18:10	Biostatistics (room 5.007) Chair: David Kraus
17:30 – 17:50	Tereza Dračková, Radovan Vavrek , Petra Majerová, Andrej Kováč, Stanislav Katina <i>Protein Intensity or Occurrence: Which of the Two Should be Used for Statistical Analyses in Animal Studies of Alzheimer's Disease?</i>
17:50 – 18:10	Tomáš Fürst <i>Inferring Vaccine Effectiveness From Observational Data</i>
18:15 – 18:55	Poster session (foyer, sixth floor) Friday I. Agu, Ján Mačutek <i>On an Estimation of Parameters of Discrete Distributions from the Schröter Family</i> Rafał Bieńkowski, Krzysztof Rutkowski <i>On the Use of Octree Method in Application to Cultural Heritage</i> Andrej Dvurečenskij , Martina Chvosteková, Daniel Gogola <i>Classification of Cyclists and Pedestrians Data Measured by LiDAR Sensor</i> Jan Koláček , Ondřej Pokora, David Vališ, Petr Procházka <i>Modelling of Lithium-ion Batteries' Reliability in Electric-Powered Aircraft</i> Ewa Bednarczuk, Rafał Bieńkowski, Robert Kłopotek, Jan Kryński, Krzysztof Leśniewski , Krzysztof Rutkowski, Małgorzata Szelachowska <i>Matching of 3D Surfaces Using Approximations of Wasserstein Distance</i> Radim Navrátil <i>Data Mining Methods in Value Stream Mapping</i> Ondřej Pokora <i>Stochastic Modelling Based on Diffusion and Jump Processes</i> Petr Šmíd , Pavel Horváth, Vladimíra Nožková, Jakub Pechník <i>Statistical Characteristics in Study of Structural Changes During Desiccation Stress of Plant Leaf by Speckle Effect</i>
19:00 – 22:00	Get together (foyer, sixth floor)

Tuesday June 13 (9:00 – 16:00)

8:30 – 9:00	Registration
9:00 – 10:30	Invited lectures (room 5.007) Chair: Karel Hron
9:00 – 9:45	Kaisa Miettinen <i>Potential of Interactive Methods in Data-Driven Multiobjective Optimization</i>
9:45 – 10:30	Karl Gerald van den Boogaart <i>Bayes Spaces. An Overview</i>
10:30 – 11:00	Coffee break
11:00 – 12:20	Statistical methodology (room 5.007) Chair: Karl Gerald van den Boogaart
11:00 – 11:20	Una Radojčić , Niko Lietzén, Klaus Nordhausen, Joni Virta <i>Order Determination for Tensor-valued Observations Using Data Augmentation</i>
11:20 – 11:40	Yetkin Tuuç , Olcay Arslan <i>Variable Selection in Restricted Regression Models</i>
11:40 – 12:00	Marie Hušková , Charl Pretorius <i>Detection of Changes in Panel Data Models</i>
12:00 – 12:20	Jaromír Antoch <i>Differentiation of Manuscripts Based on Analysis of NIR Spectra</i>
11:00 – 12:20	Differential equations (room 5.008) Chair: Jana Burkotová
11:00 – 11:20	Věra Krajšćáková <i>Existence and Multiplicity of Solutions of the Linear Boundary Value Problem for the Stieltjes Differential Equation</i>
11:20 – 11:40	Richard Andrášik, Václav Mácha, Rostislav Vodák <i>Relative Energy Inequality and Weak-strong Uniqueness for an Isothermal Non-Newtonian Compressible Fluid</i>
11:40 – 12:00	Milan Pokorný <i>Homogenization of Compressible Navier–Stokes–Fourier System in Domains with Tiny Holes</i>
12:00 – 12:20	Raj Narayan Dhara <i>Existence of Solutions of Degenerate Semilinear Elliptic Boundary Value Problems</i>
12:30 – 13:30	Lunch (Kozlovna restaurant)

13:30 – 15:10	Functional data analysis (room 5.007) Chair: Jan Kolářek
13:30 – 13:50	Jan Elgner , Jiří Ambros, Eva Fišerová <i>Effectiveness of Road Marking and Signing Assessed by Functional Interval Testing</i>
13:50 – 14:10	Eva Fišerová , Veronika Římalová <i>Statistical Inference in a Spatial Functional Model in the Presence of Heteroscedasticity</i>
14:10 – 14:30	Markéta Makarová <i>Recent Advances in Functional Data Analysis Using Machine Learning Techniques</i>
14:30 – 14:50	Zdeněk Hlávka , Daniel Hlubinka, Šárka Hudecová <i>Multivariate Permutation Tests and Functional m-sample Comparisons</i>
14:50 – 15:10	David Kraus <i>Prediction Sets for Sparse Functional Data: How to Fail It and How to Fix It</i>
13:30 – 15:10	Models, equations & computations III (room 5.008) Chair: Kaisa Miettinen
13:30 – 13:50	Petr Hamal , Jakub Kmec <i>Next-generation Fluorescence Telescopes for Cosmic Rays</i>
13:50 – 14:10	Jakub Kmec , Petr Hamal <i>Next-generation Fluorescence Telescopes for Cosmic Rays: Data Analysis and Categorization</i>
14:10 – 14:30	Tomáš Krátký , Jana Burkotová, Jakub Stareček <i>Multiobjective Optimization of an Axial Pump</i>
14:30 – 14:50	Jana Burkotová , Tomáš Krátký, Pouya Aghaei Pour, Atanu Mazumdar, Tinkle Chugh, Kaisa Miettinen <i>Multiobjective Optimization of Hydraulic Pump Design Problem with Computationally Expensive Simulations</i>
14:50 – 15:10	Tinkle Chugh <i>Multi-surrogate Approaches in Multi-objective Bayesian Optimisation</i>
15:20 – 16:00	Measurement uncertainty evaluation methods (room 5.007) Chair: Viktor Witkovský
15:20 – 15:40	Gejza Wimmer , Viktor Witkovský <i>Straight-Line Errors-in-Variables Calibration Model</i>
15:40 – 16:00	Pavel Pavlíček <i>Phase Measuring Deflectometry – Measurement Uncertainty by Cramér – Rao Inequality</i>
15:20 – 16:00	Numerical aspects of Stokes systém (room 5.008) Chair: Milan Pokorný
15:20 – 16:00	Jaroslav Haslinger , Radek Kučera, Kristina Motyčková, Václav Šátek <i>Approximation and Numerical Realization of the Stokes System with Nonsmooth Slip Boundary Conditions</i>
16:00 – 16:30	Coffee break
17:15 – 17:45	Excursion group 1 (production of Olomouc curd cheese, in English)
18:15 – 18:45	Excursion group 2 (production of Olomouc curd cheese, in Czech)
19:00 – 22:00	Conference dinner (Tvarg restaurant)

Wednesday June 14 (9:30 – 12:00)

9:30 – 10:30 Statistical methodology II (room 5.007)

Chair: Stanislav Katina

9:30 – 9:50 **Martin Boďa**, Mariana Považanová, Jiří Škvor, Iveta Stankovičová
Okun's Law Disaggregated and Factors behind: a Case Study of V4 Countries

9:50 – 10:10 Monika Syga, **Agnieszka Kaliszewska**
Clustering of Shapes. A Study of Selected Similarity Measures for the Clustering of 2D Curves

10:10 – 10:30 **Vojtěch Šindlář**, Stanislav Katina
Different Approaches in the Shape Index Calculation on a Human Face

10:30 – 11:00 Coffee break

11:00 – 12:00 Statistical methodology III (room 5.007)

Chair: Jaromír Antoch

11:00 – 11:20 **Markéta Janošová**, Stanislav Katina
Methods of Estimating Parameters of Skewed or Truncated Normal Distribution in the Presence of Observations Outside of Measurable Range

11:20 – 11:40 **Josef Janák**, Randolph Altmeyer, Till Bretschneider, Markus Reiß
Parameter Estimation in an SPDE Model for Cell Repolarisation

11:40 – 12:00 **Martina Chvosteková**
Estimation and Significance Testing of Rényi Transfer Entropy

12:00 Closing (room 5.007)

12:30 – 13:30 Lunch (Kozlova restaurant)