

Olomoucian Days of Applied Mathematics



Faculty of Education, Palacký University Olomouc
Žižkovo náměstí 5, Olomouc, 771 40

Scientific program
May 31 – June 2, 2017

Wednesday May 31 (9:15 – 17:10)

09:15 – 10:00	Registration
10:00 – 10:10	Opening (room N2)
10:10 – 10:55	Invited lecture (room N2) Chair: Jana Jurečková
10:10 – 10:55	Johanna Nešlehová (invited speaker) <i>Modeling extremal dependence with copulas</i>
11:00 – 12:00	Random processes (room N2) Chair: Johanna Nešlehová
11:00 – 11:20	Zbyněk Pawlas <i>Estimation of characteristics in line segment processes</i>
11:20 – 11:40	Kateřina Koňasová <i>Stochastic reconstruction for inhomogeneous point processes</i>
11:40 – 12:00	Jana Jurečková <i>Empirical regression quantile processes</i>
11:00 – 12:00	Fuzzy sets and decision making methods 1 (room N24) Chair: Jana Talašová
11:00 – 11:20	Slavka Bodjanova, Martin Kalina <i>Summary characterization of decision tables based on L-fuzzy sets</i>
11:20 – 11:40	Slavka Bodjanova , Martin Kalina <i>Construction of uninorms which are neither conjunctive nor disjunctive</i>
11:40 – 12:00	Jana Krejčí <i>Constrained fuzzy arithmetic in the fuzzy extension of methods based on pairwise comparison matrices</i>
12:00 – 13:30	Lunch (Menza Šmeralova)
13:30 – 15:10	Regression methods (room N2) Chair: Jan Koláček
13:30 – 13:50	Katarína Sternmüllerová, Andrej Pázman <i>Experimental design for avoiding false estimates in nonlinear models</i>
13:50 – 14:10	Eva Fišerová <i>Fitting ellipsoids to correlated data</i>
14:10 – 14:30	Martina Chvosteková <i>Multivariate calibration and multiple use confidence regions</i>
14:30 – 14:50	Kristýna Vaňkátová, Eva Fišerová <i>Heterogeneous population modelling using mixture models approach</i>
14:50 – 15:10	Nikola Štefelová, Andreas Alfons, Javier Palarea-Albaladejo, Peter Filzmoser, Karel Hron <i>Regression analysis with compositional covariates in the presence of cellwise contamination</i>
13:30 – 14:30	Fuzzy sets and decision making methods 2 (room N24) Chair: Ondřej Pavlačka
13:30 – 13:50	Ondřej Pavlačka, Pavla Rotterová <i>Fuzzy decision matrices viewed as fuzzy rule-based systems</i>
13:50 – 14:10	Pavla Rotterová, Ondřej Pavlačka <i>Fuzzy decision matrix with underlying fuzzy probability measure</i>
14:10 – 14:30	Tomáš Talášek, Jan Stoklasa, Jana Talašová <i>Performance of selected distance and similarity measures in linguistic approximation under uniform output linguistic scales</i>

15:10 – 15:30	Coffee break
15:30 – 17:10	Mathematical and applied statistics 1 (room N2)
	Chair: Ján Mačutek
15:30 – 15:50	Milan Hladík <i>Recognizing pseudoconvexity of a function on an interval domain</i>
15:50 – 16:10	Miroslav Rada, Michal Černý <i>A lower bound for Tukey's depth of interval-valued data</i>
16:10 – 16:30	Ondřej Vencálek, Oleksii Pokotylo <i>Depth-weighted Bayes classification</i>
16:30 – 16:50	Alena Pozdílková, Jaroslav Marek <i>Usage of artificial intelligence and spectral analysis for predicting the behavior of stock prices</i>
16:50 – 17:10	Pavel Pavlíček <i>Measurement uncertainty caused by surface roughness</i>
15:30 – 17:10	GeoGebra (room N24)
	Chair: David Nocar
15:30 – 15:50	Zuzana Morávková <i>Everything you always wanted to know about GeoGebra</i>
15:50 – 16:10	Petr Volný <i>3D modul in GeoGebra</i>
16:10 – 16:30	Jana Volná <i>Nets of solids in GeoGebra</i>
16:30 – 16:50	Radomír Paláček <i>Differential and integral calculus in Geogebra</i>
16:50 – 17:10	Petra Schreiberová <i>Teaching probability and statistics by using GeoGebra</i>
19:00	Get together (Goliáš restaurant)

Thursday June 1 (8:40 – 15:00)

8:40 – 10:20 Biostatistics (room N2)

Chair: Stanislav Katina

8:40 – 9:00 **Silvie Bělašková**, Eva Fišerová

Using higher order asymptotic to improve the accuracy of tests in the Cox model

9:00 – 9:20 **Markéta Janošová**, Stanislav Katina, Marek Rovňák

Analysis of patient's health condition after total knee replacement surgery and it's development through time

9:20 – 9:40 **Veronika Bendová**, Stanislav Katina, Markéta Janošová, Marek Rovňák, Libor Nečas

Cox proportional hazards model: A tool for evaluation of knee implant survival conditional on patient reported outcome measures

9:40 – 10:00 **Mojmír Vinkler**, Stanislav Katina, et al.

Improving longitudinal volumetric measurements of patients with Alzheimer's disease by MRI denoising

10:00 – 10:20 **Zdeňka Geršlová**, Stanislav Katina, Igor Riečanský

Three approaches in functional data analysis of event-related potentials in time domain

9:00 – 10:20 Numerical methods 1 (room N24)

Chair: Rostislav Vodák

9:00 – 9:05 **Opening**

9:05 – 9:30 **Igor Bock**

On hyperbolic variational inequalities modeling dynamic contacts of solid structures

9:30 – 9:55 **Horymír Netuka**, Jitka Machalová

The control variational method and solution of the Gao beam

9:55 – 10:20 **Jitka Machalová**, Horymír Netuka

Solution of contact problems for Gao beam and deformable foundation

10:20 – 10:40 Coffee break

10:40 – 12:00 Probability and mathematical statistics (room N2)

Chair: Karel Hron

10:40 – 11:00 **Jaromír Antoch**

Detection of breaks in a capital structure

11:00 – 11:20 Zdeněk Hlávka, **Marie Hušková**, Simos Meintanis

Change point detection with multivariate observations based on characteristic functions

11:20 – 11:40 **Matúš Maciak**, Ivan Mizera

Post-selection inference in regression models with change points and shape constraints

11:40 – 12:00 **Ján Mačutek**, Michaela Koščová, Lívia Leššová

Some properties of partial-sums discrete probability distributions

10:45 – 12:00 Numerical methods 1 (room N24)

Chair: Igor Bock

10:45 – 11:10 **Jan Valdman**

Energy identities for variational problems with obstacles

11:10 – 11:35 **Rostislav Vodák**

On some optimization problems in transportation research

11:35 – 12:00 **Stanislav Mazurenko**, Jiri Damborsky, Zbynek Prokop

Reachable sets in optimisation of multi-enzyme pathways

12:00 – 13:20 Lunch (Menza Šmeralova)

13:30 – 14:30	Mathematical and applied statistics 2 (room N2) Chair: Marie Hušková
13:30 – 13:50	Šárka Brodinová , Peter Filzmoser, Thomas Ortner, Maia Zaharieva , Christian Breiteneder <i>Grouping and outlier detection using robust sparse clustering</i>
13:50 – 14:10	Irene Hoffmann , Peter Filzmoser, Sven Serneels <i>Inference for sparse and robust partial least squares regression</i>
14:10 – 14:30	Thomas Ortner , Peter Filzmoser, Šárka Brodinová, Maia Zaharieva , Christian Breiteneder <i>Local projections for outlier detection</i>
14:30 – 15:00	Poster session (foyer, second floor) Jan Kolářek , Ondřej Pokora, Tzai-Wen Chiu, Wei Qiu <i>Functional data analysis in neural processing</i> Daniela Kuruczová <i>Local bandwidth selection in nonparametric functional regression</i> Radim Navrátil <i>Minimum distance tests and estimates based on ranks</i> Ondřej Pokora , David Vališ <i>Application of selected diffusion processes in modelling of system degradation</i> Iveta Selingerová <i>Survival regression models: assessment of different approaches</i> Tereza Šimková <i>L-moment homogeneity test in linear regression</i>
13:20 – 15:00	Numerical methods 3 (room N24) Chair: Jan Valdman
13:20 – 13:45	Richard Andrášik , Rostislav Vodák <i>Compressible nonlinearly viscous fluids: Asymptotic analysis in a 3D curved domain</i>
13:45 – 14:10	Jakub Kmec , Tomáš Fůrst, Rostislav Vodák, Miloslav Šír <i>Porous media flow</i>
14:10 – 14:35	Tomáš Krátký , Lukáš Zavadil, Jakub Kmec <i>Multi-objective optimization of expensive black-box function for pump hydraulic design</i>
14:35 – 15:00	Josef Rak <i>Mathematical model of induction heating</i>
16:00	Excursion and conference dinner (Chomout brewery)

Friday June 2 (9:00 – 12:00)

9:00 – 10:40 Compositional data analysis (room N2)

Chair: Jaromír Antoch

9:00 – 9:20 **Jan Walach**, Peter Filzmoser, Karel Hron, Beata Walczak, Lukáš Najdekr
A variable selection method for a two-group problem based on a pairwise log-ratio approach

9:20 – 9:40 **Julie Rendlová**, Kamila Fačevicová, Karel Hron, Peter Filzmoser
Dimension reduction for compositional tables using robust principal component analysis

9:40 – 10:00 **Kamila Fačevicová**
Towards multifactorial analysis of compositional data

10:00 – 10:20 **Alžběta Gardlo**, Karel Hron
Weighted pivot coordinates and its application to metabolomics

10:20 – 10:40 **Karel Hron**, Peter Filzmoser, Patrice de Caritat, Eva Fišerová
Choice of weights in weighted pivot coordinates with application to geochemical mapping

9:00 – 9:50 Numerical methods 4 (room 5.068, Faculty of Science, 17. listopadu 12)

Chair: Horymír Netuka

9:00 – 9:25 **Jaroslav Haslinger**
Stokes problems with stick-slip boundary conditions: Approximations and numerical realization

9:25 – 9:50 **Radek Kučera**
An interior point algorithm for solving the Stokes problems with stick-slip boundary conditions using the FETI method

9:50 Closing of Numerical methods session

10:40 – 11:00 Coffee break

11:00 – 12:00 Functional data analysis (room N2)

Chair: Zbyněk Pawlas

11:00 – 11:20 **Veronika Římalová**, Eva Fišerová
On functional data analysis with application in geology

11:20 – 11:40 **Zuzana Rošťáková**, Roman Rosipal
Multilevel functional principal components analysis in the case of unbalanced design and small number of subjects

11:40 – 12:00 **Renáta Talská**, Alessandra Menafoglio, Karel Hron, Eva Fišerová, Jitka Machalová
Linear regression models with distributional response

12:00 Closing

12:10 – 13:00 Lunch (Menza Šmeralova)