

MACS 2022

**14th Joint Conference on Mathematics and Computer Science
Cluj-Napoca, November 24–27, 2022**

Conference Program



UNIVERSITATEA BABEŞ-BOLYAI
BABEŞ-BOLYAI TUDOMÁNYEGYETEM
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TRADITIO ET EXCELLENTIA

Sponsors of MaCS 2022:



CONTROL ACCES



Friday (November 25)

09:00 Registration: in front of Aula Magna

Aula Magna:

10:00 Conference opening: Anna Soós, Anca Andreica, Tamás Kozsik

11:00 Plenary talk: Zsolt Páles

11:30 Plenary talk: Mirela Kohr

12:00 COFFEE BREAK

Probability, statistics, numerical methods (Club)

Session chair: Levente Lócsi

12:20 S. Kolumbán, B. Cs. Csáji:

A Stochastic Geometric Optimization Problem for Finite Sample Input Design

12:40 H. Lisei:

On a stochastic Ginzburg-Landau equation with multiplicative noise term

13:00 L. Lócsi:

Identification of Induction Curves

13:20 B. Gerencsér, Zs. Várkonyi:

Fast synchronization of inhomogenous random automata

Artificial intelligence 1 (Goangă)

Session chair: Lehel Csató

K. Mzwri, M. Turcsányi-Szabó:

Internet Wizard for Enhancing Question Answering Chatbot Knowledgebase

C.-I. Coste, A.-M. Andreica, C. Chira, D.-V. Bufeana:

Malicious Web Link Detection - Comparison between ML Algorithms

A. Mester, Z. Bodó:

Malware analysis and static call graph generation with Radare2

A. D. Călin, A. M. Coroiu, H. B. Mureşan:

Feasibility of using machine learning algorithms for yield prediction based on seeding date for sunflower and corn crops

13:40 LUNCH BREAK

Algebra (Club)

Session chair: Csaba Szántó

15:00 Zs. Baja:

Numerical semigroups associated with weighted homogeneous complex surface singularities

Graphs, networks (Goangă)

Session chair: Noémi Gaskó

A. Andreica, A. Mester:

Network optimization problem applicable for breast cancer screening cost minimization

15:20 I.-E. Chiru:
Strongly regular matrices revisited

15:40 Cs. Szántó:
Ringel-Hall polynomials associated to a quiver of type \tilde{D}_4

16:00 V.-A. Minuță:
An exact sequence for the graded Picent group

16:20 I. I. Simion:
On the product expansion of normal subsets in simple groups

R. Dragoș, V. Roșianu, D. Șotropa:
Generating semantic webpages from knowledge graphs

B.E.M. Mursa, A. Andreica:
A tale of controllability: evolving network motifs in random Complex Networks

R.-B. Petruș, R.-M. Vaida, C. Chira:
Evolutionary algorithms for solving Traveling Salesman Problems

G. Stoia:
Analysis of recent complex network centrality measures

16:40 COFFEE BREAK

Differential equations (Club)
Session chair: Zsolt Páles

17:00 D. Brumar:
A fixed point approach to semi-linear Stokes problems

17:20 I. I. Mezei:
Differential inclusions on non-compact Riemannian manifolds

17:40 P. L. B. Ngoc, T. Krisztin, M. Polner:
Absence of periodic orbit for a nonlinear delay differential equation

18:00 T. Groșan, F. O. Patrulescu:
Natural convection in a bidisperse porous medium. Effect of internal heat generation

18:20 Sz. Cs. László:
On the strong convergence of the trajectories of Tikhonov regularized second order dynamical systems

Mathematical epidemiology (Goangă)

Session chair: Horia F. Pop

S. Barua, B. Das, A. Dénes:
A compartmental model for COVID-19 to assess effects of non-pharmaceutical interventions with emphasis on contact-based quarantine

E. K. Korir, Zs. Vizi:
Clustering of countries based on the associated social contact patterns in epidemiological modelling

N. Ibrahim, A. Dénes:
Global dynamics of a within-host model for Usutu virus

B. Das, G. Röst:
Dynamics of Herpes and Chlamydia Co-Infection in a Population

R. Opoku-Sarkodie, F. A. Bartha, M. Polner, G. Röst:
Dynamics of an SIRWS model with immune boosting and secondary infections

19:00 CONCERT: Visszhang kórus

Saturday (November 26)

Goangă:

- 09:30 Plenary talk: Zoltán Horváth
10:00 Plenary talk: Alexandru Kristály
10:30 Plenary talk: Ovidiu Bagdasar

11:00 COFFEE BREAK

Analysis and optimization 1 (Club) Session chair: Brigitte Breckner

- 11:20 A. Malina:
New Shepard operators in the univariate case
- 11:40 A. E. Capătă:
On some existence results for solutions to bilevel strong vector equilibrium problems
- 12:00 V.-A. Fodor:
Characterizations of solutions to equilibrium problems via extreme or exposed points
- 12:20 A. Grad:
Generalized Set-Valued Optimality Conditions
- 12:40 A. Viorel:
Convergence rates for variable step size inexact proximal algorithms

Programming languages, software systems 1 (Goangă)

Session chair: Judit Robu

- R. Lupşa, D. Lupşa:
On composing asynchronous operations
- L. D. Cernău:
Object-Oriented Complexity Metrics Overview
- A. Fekete, Z. Porkoláb:
Report on a Field Experiment of the Memory Retention of Programmers Regarding Source Code
- P. Kaszab, M. Cserép:
Detecting programming flaws in student submissions with static analysis of the source code
- S. Surdu:
Evaluating the Join Operation on Data Streams

13:00 LUNCH BREAK

Analysis and optimization 2 (Club) Session chair: Marcel Şerban

- 14:00 A. Stan:
On the existence of Nash equilibria for nonvariational systems

Artificial Intelligence 2 (Goangă)

Session chair: Laura Dioşan

- M. Kuti-Kreszács:
Ensemble methods and their interpretability in demand forecasting

- 14:20 A. Orzan:
Dinkelbach type approximation algorithms for nonlinear fractional optimization problems
- 14:40 M. González, P. Martín-Chávez, I. M. del Puerto:
A scaling limit theorem of critical controlled branching processes
- 15:00 M. Gencsi, B. G.-Tóth:
The geometrical optimality test in Interval Branch and Bound method
- A. Bajcsi, C. Chira:
Towards feature extraction for lesion type detection in mammograms
- Á. Portik, A. Bajcsi, A. Bajcsi, Z. Bodó, L. Csató, Sz. Pável, Cs. Sándor, A. Szenkovits, O. Vas:
An overview of prototype-based self-explaining models
- K. Buza, M. Antal:
An Extension of Dynamic Time Warping for Images: Dynamic Image Warping

15:20 **COFFEE BREAK**

Complex, convex and functional analysis (Club)

Session chair: Cornel Pintea

- 15:40 B. E. Breckner:
A note on dense sets in normed spaces
- 16:00 C. Günther, B. Khazayel, C. Tammer:
Nonlinear Cone Separation Theorems in Real Reflexive Banach Spaces
- 16:20 C. P. Niculescu:
The convexity flavor of the Hornich-Hlawka functional inequality
- 16:40 C. Pintea:
Closed convex sets with relative boundaries equal to their Pareto-like subsets

Artificial Intelligence 2 – cont'd

- M. Popa:
Image segmentation techniques
- A. Kopacz, L. Csató, C. Chira:
Competitive influence maximization in trust-based social networks with deep Q-learning
- M. Dicu, C. Chira, A. Sterca, R. Orghidan:
Graphical User Interface Element Detection using Faster Region-based Convolutional Neural Network Models
- O. A. Trifan, D. Todască, A. Susciuc:
Predicting Indoor Radon Levels in Romania using Machine Learning Algorithms

17:00 **COFFEE BREAK**

Complex, convex and functional analysis – cont'd

- 17:20 R. Szász:
Conditions for starlikeness and convexity of analytic functions

Programming languages, software systems 2 (Goangă)

- Session chair: Zoltán Horváth**
- Zs. Erdei, M. Tóth, I. Bozó:
Supporting debugging in Erlang with symbolic execution

17:40	E. Ş. Grigoriuc: <i>The Graham-Kohr extension operator and subclasses of biholomorphic mappings in \mathbb{C}^n</i>	E. Fülöp, A. Gyén, N. Pataki: <i>XRayng the Execution of C++ Code for an Improved Visualization</i>
18:00		D. B. Rátai, Z. Horváth, Z. Porkoláb, M. Tóth: <i>Evaluation of the Traquest model</i>
18:20		A. Dhulfiqar, M. C. Ogbuachi, N. Pataki: <i>MEC – Applications deployment and testing using Simu5G</i>

19:30 **CONFERENCE DINNER**

Sunday (November 27)

11:00 **Sightseeing Cluj**