

11th Annual Meeting of the Bulgarian Section of SIAM

BGSIAM'16

December 20-22, 2016, Sofia, Bulgaria

Scientific program

Tuesday, December 20

08:30 – 09:00 **Registration**

09:00 – 09:10 **Opening**

Chairperson: Svetozar Margenov

09:10 – 09:50 I. Markovski, A low-rank matrix completion approach to data-driven signal processing (p. 56)

09:50 – 10:10 Teodor M. Atanacković, On a constitutive equation of heat conduction with fractional derivatives of complex order (p. 6)

10:10 – 10:30 Stevan Pilipović, Complex fractional Zener model of wave propagation in viscoelastic media (p. 63)

10:30 – 10:50 **Coffee break**

Special session “*Computational Mechanics*” (joint event with the Bulgarian National Section of GAMM)

Chairperson: Virginia Kiryakova

10:50 – 11:10 E. Popova, Exact bounds for the unknowns in some interval FE models of structures (p. 64)

11:10 – 11:30 L. Parashkevova, Pedro Egizabal, Modelling of light Mg and Al based alloys as “in situ” composites (p. 60)

11:30 – 11:50 R. Kovacheva, On the strong asymptotic of rows of classical Padé approximants (p. 51)

11:50 – 12:10 D. Kisliakov, Water hammer in a multiple-supported penstock and earthquake-induced support excitation - coupled analysis of the axial load case (p. 47)

12:10 – 12:30 Evtim V. Zahariev, Modified coordinates for dynamics simulation of multibody systems with elastic bodies (p. 77)

12:30 – 13:30 **Lunch time**

Chairperson: Nikolay Kutev

13:30 – 14:10 V. Alexandrov, Data and Computational Science Methods Applied to Social Media

14:10 – 14:30 H. Safouli, P. Gaudrea, R. Slevinsky, Computation of energy eigenvalues of the Schrödinger equation with harmonic oscillators (p. 70)

14:30 – 14:50 S. Enkov, S. Hristova, E. Madamlieva, Approximate method for non-instantaneous impulsive difference equations with a periodic boundary condition (p. 22)

14:50 – 15:10 V. Angelova, Local perturbation analysis of the stochastic matrix Riccati equation with applications in finance (p. 4)

15:10 – 15:40 **Coffee break**

Special session “*Biomedical Applications*”

Chairperson: Vassil Alexandrov

15:40 – 16:00 N. Ilieva, J. Liu, P. Petkov, J. He, and A. Niemi, Modular approach to large-scale biomolecule simulations (p. 38)

16:00 – 16:20 N. Ilieva, E. Lilkova, P. Petkov, and L. Litov, Identification of structural units in large proteins for guided metadynamics investigations (p. 35)

16:20 – 16:40 S. Tabakova, S. Radev, N. Kutev, Asymptotic study of the nonlinear velocity problem for the oscillatory non-Newtonian flow in a straight tube (p. 73)

16:40 – 17:00 M. Borisov, N. Kyurkchiev, S. Markov, On the formulation of population growth models by means of reaction networks (p. 16)

17:00 – 17:20 P. Rashkov, Emergence of Hormesis in a Simple Enzyme Kinetic Model (p. 66)

17:30 **Welcome drink**

Wednesday, December 21

Chairperson: Stefka Fidanova

- 09:00** – 09:20 Stanislav Harizanov, Fast algorithm for solving ℓ^0 -constrained graph-Laplacian minimization (p. 27)
- 09:20 – 09:40 S. Harizanov, J. de Dios Pont, S. Ståhl, D. Wenzel, Denoising and feature extraction of 2D CT radiographic images (p. 29)
- 09:40 – 10:00 Nikolay K. Vitanov, Kaloyan N. Vitanov, Box model of migration in channels of networks (p. 75)

10:00 – 10:30 **Coffee break and poster session**

Chairperson: Stanislav Harizanov

- 10:30** – 10:50 E. Atanassov, A. Karaivanova, T. Gurov, Advanced services for Virtual Research Environments (p. 8)
- 10:50 – 11:10 A. Alexandrov, Method and algorithm for WSN time synchronization based on Kalman filter and Fraser-Potter equation (p. 2)
- 11:10 – 11:30 T. Balabanov, M. Barova, D. Keremedchiev, Image construction with 2D ellipses by genetic algorithms optimization (p. 10)

11:30 – 12:00 **Business meeting of BGSIAM Section (for SIAM members only)**

12:00 – 13:00 **Lunch time**

Chairperson: Krassimir Georgiev

- 13:00** – 13:40 O. Iliev, J. Mohring, N. Shegunov, R. Milk, M. Ohlberger, Toward exascale computations of uncertainty quantification for porous media flow using multilevel Monte Carlo (p. 33)
- 13:40 – 14:00 M. Ben-Artzi, J.-P. Croisille, D. Fishelov, An embedded compact scheme for biharmonic problems in irregular domains (p. 14)
- 14:00 – 14:20 M. Terziyska, Y. Todorov, M. Dobрева, Efficient error based metrics for fuzzy-neural network performance evaluation (p.74)
- 14:20 – 14:40 E. Nikolova, I Jordanov, Z. Dimitrova, N. Vitanov, Nonlinear evolution equations for propagation of waves in arteries with aneurysms: exact solutions obtained by the modified method of simplest equation (p. 58)
- 14:40 – 15:00 K. Liolios, V. Tsihrintzis, K. Georgiev, I. Georgiev, P. Angelidis, Optimal mathematical model for the simulation of removal of pollutants in constructed wetlands: linear or non-linear procedures? (p. 52)
- 15:00 – 15:30 **Coffee break**

Chairperson: Pencho Marinov

- 15:30** – 15:50 G. Evtimov, S. Fidanova, Ant Colony optimization algorithm for 1D Cutting Stock Problem (p. 24)
- 15:50 – 16:10 S. Ismaili, S. Fidanova, Representation of civilians and police officers by generalized nets for describing software agents in the case of protest (p. 40)
- 16:10 – 16:30 H. Kostadinov, N. Manev, About flash memories and error correcting codes (p. 49)
- 16:30 – 16:50 L. Markov, Some results involving Euler-type integrals and dilogarithm values (p. 54)
- 16:50 – 17:10 K. Vlachkova, Convexity preserving scattered data interpolation using Powell-Sabin elements

18:00 **Conference Dinner**

Thursday, December 22

Chairperson: Ivan Georgiev

- 09:00** – 09:40 Kr. Danov, Modeling of membranes with complex rheology: computational aspects (p. 20)
- 09:40 – 10:00 S. Bushev, Industrial mathematics - phase transitions, scattering, structures (p. 17)
- 10:00 – 10:20 I. Jordanov, I. Dushkov, E. Nikolova, N. Vitanov, Applications of time delay differential equations in dynamics of a system of three competing populations (p. 45)
- 10:20 – 10:40 **Coffee break**

Special session "Mathematics in Industry"

Chairperson: Michail Todorov

- 10:40** – 11:00 S. Harizanov, D. Dimov, N. Naidenov, S. Kostadinova, Multi-frame denoising of still images (p. 28)
- 11:00 – 11:20 G. Evtimov, Optimal cutting problem
- 11:20 – 11:40 T. Balabanov, N. Manev, W. Mudzimbabwe, P. Tomov, I. Zankinski, S. Zhelezova, Authenticity management algorithm for digital images (p. 12)
- 11:40 – 12:00 T. Ivanov, G. Lyutskanova, D. Aleksov, O. Kounchev, Laboratory calibration of MEMS rate sensors (p. 42)
- 12:00 – 12:20 Z. Minchev, Future cyber risks landscape exploration: modelling, simulation, validation & verification (p. 57)

12:20 **Closing**

List of posters:

1. I. Georgiev, S. Harizanov, I. Lirkov, Denoising and edge detection in 2D radiographic images: Theory and applications
2. I. Georgiev, S. Harizanov, S Margenov, P. Marinov, Y. Vutov, Innovative algorithm on supervised 3D segmentation of CT data, incorporating various types of information about the scanned object
3. A. Georgieva, A. Pavlova, I. Naydenova, Error estimate in the iterative numerical method for two-dimensional nonlinear Hammerstein-Fredholm fuzzy functional integral equations (p. 26)
4. I. Georgieva, C. Hofreither, Fast approximation of bivariate functions using low-rank splines
5. D. Iankov, M. Datcheva, R. Iankov, Material parameter identification of thin film with diamond nanoparticles via nanoindentation (p. 31)
6. Y. Ivanova, T. Partalin, I. Georgiev, Comparison of NDT techniques for elastic modulus determination of laminated composites (p. 43)
7. P. Petrova, B. Petrova, E. Simeonov, Ch. Chilev, Theoretically sampling of reactive distillation using the RCM method (p. 62)
8. P. Rashkov, Competition for resources and space contributes to the emergence of drug resistance in cancer (p. 68)

THE EVENT WILL TAKE PLACE AT THE HOTEL OF BULGARIAN ACADEMY OF SCIENCES

Shipchenski prohod Str. 50, Sofia, Bulgaria

