KSIAM 2019 Annual Meeting

Yeosu Venezia Hotel, Yeosu, Korea
November 8-10, 2019

SCHEDULE

▶ **Opening Ceremony** November 8th, 13:00-13:10 [Convention Hall]
- Kim, Chongam (President of KSIAM)

▶ **Invited Talks**
○ Jung, Eunok (Department of Mathematics, Konkuk University)
- The Vision and Role of Biomathematics in Biomedical Industry and Government Policy
- November 8th, 13:10-14:00 [Convention Hall]

○ Kang, Myungjoo (Department of Mathematical Sciences, Seoul National University)
- Level Set Method, Image Processing and Deep Learning
- November 8th, 16:00-16:50 [Convention Hall]

○ Oh, Se Jong (Department of Aerospace Engineering, Pusan National University)
- Application of Mathematical Modelling to CFD for Numerical Efficiency for Rotorcraft Analysis
- November 9th, 9:00-9:50 [Convention Hall]

▶ **Annual Meeting** November 8th, 18:00-18:20 [Convention Hall]
▶ **Panel Discussion I** November 8th, 17:00-18:00 [Convention Hall]
▶ **KSIAM Outstanding Young Investigator Award** November 9th, 11:20-12:00 [Convention Hall]
▶ **Poster Session** November 9th, 14:20-15:20 [Festa]

▶ **Special Sessions**
○ Applied Algebra and Geometry
○ Bio-inspired computing
○ Combinatorial and Discrete Optimization I, II
○ Existence, uniqueness, regularity and stability for PDEs related to fluids
○ Fluid-Structure Interaction
○ GeoMathematics and its applications
○ MATLAB을 활용한 인공지능
○ Medical Mathematics I, II
○ PDE modeling, numerical simulations and related applications
○ Recent advances in mathematical modelingof swarming
○ 불연속 Galerkin / High-Order methods for PDE

▶ **General Sessions**
○ Partial Differential Equations, Applied Probability
○ Biomathematics, Bioinformatics, Biological and Medical Modeling
○ Computer Graphics and Game, IT and Its Industrial Applications, Cryptology
○ Industrial Engineering and Applied Mathematics
○ Inverse Problems, Control and Optimization
○ Applied Analysis
○ Mechanics of Compressible and Incompressible Fluids, Solid Mechanics and Elasticity
○ Numerical Analysis and Scientific Computation

▶ **Welcome Reception** : November 8th, 18:30-20:00 [Convention Hall]

Time	[Convention] Special Session : Bio-inspired computing	[Burano 1] Special Session : Combinatorial and Discrete Optimization I	[Burano 2] Special Session : Medical Mathematics I	[Burano 3] Special Session : MATLAB을 활용한 인공지능 (머신러닝/딥러닝부터 강화학습까지)
13:00-13:10	[Convention Hall] Opening Ceremony Chongam Kim (President of KSIAM)			Chair: Sang Joon Shin
13:10-14:00	[Convention Hall] Plenary Talk I			Chair: Hee-Dae Kwon
	The Vision and Role of Biomathematics in Biomedical Industry and Government Policy Eunok Jung (Konkuk University)			
14:00-14:20	Coffee Break			
	Chair: Pilwon Kim	Chair: Dabeen Lee	Chair: Hyoung Suk Park	Chair: Jangwon Lee
14:20-14:40	On-chip trainable analog PCM synaptic array for spiking RBM **SangBum Kim (Seoul National University)**	Bi-criteria scheduling **Kangbok Lee (POSTECH)**	국가수리과학연구소 의료수학연구 소개 **Chi Young Ahn (NIMS)**	머신러닝의 이해 및 건전성 예측관리 시스템 개발 **Jongnam Kim (MathWorks)**
14:40-15:00	Critical neuromorphic computing based on transient dynamics **Pilwon Kim (UNIST)**	Cliques for multi-term linearization of 0-1 multilinear program for boolean logical pattern generation **Kedong Yan (Nanjing University of Science and Technology)**	Deep learning based methods for artifact correction in X-ray CT **Hyoung Suk Park (NIMS)**	딥러닝과 강화학습 **Jongnam Kim (MathWorks)**
15:00-15:20	What does "Being an Expert in Mathematics" Mean to the Brain? **Hyeon-Ae Jeon (DGIST)**	Binary mixing sets and linear programs with probabilistic constraints **Dabeen Lee (IBS)**	Automated method for classifying liver fibrosis stages using ultrasound b-mode images **Sung Ho Kang (NIMS)**	
15:20-15:40	Challenges and opportunities in Memristor-based Artificial Neural Network Hardware **Shinhyun Choi (KAIST)**	Optimal Sampling and Clustering Algorithms in the Stochastic Block Model **Se-Young Yun (KAIST)**	Electrical impedance tomography based abdominal obesity estimation using deep learning **Hyeuknam Kwon (Yonsei University)**	AI 개발 워크플로우 **Jongnam Kim (MathWorks)**
15:40-15:55	Coffee Break			
15:55-16:00	KSIAM-KUMGOK Award Ceremony Presenter: Ha, Yeon Soon (Chairman, KUMGOK Academico-Cultural Foundation)			Chair: Hee-Dae Kwon
16:00-16:50	[Convention Hall] Plenary Talk II			Chair: Hee-Dae Kwon
	Level Set Method, Image Processing and Deep Learning **Myungjoo Kang (Seoul National University)**			
16:50-17:00	Coffee Break			
17:00-18:00	[Convention Hall] Panel Discussion I			Chair: Chongam Kim
	Future Agenda of Applied Mathematics and 4th Industrial Revolution			
18:00-18:20	[Convention Hall] Annual Meeting			Chair: Bongsoo Jang
18:20-18:30	[Convention Hall] Ceremony for 2019 KSIAM-MathWorks Problem Challenge			Chair: Kiwan Jeon
18:30-20:00	[Convention Hall] Welcome Reception			Chair: Hee-Dae Kwon

09:00-09:50	[Convention Hall]	Plenary Talk III		Chair: Sang Joon
	Application of Mathematical Modelling to CFD for Numerical Efficiency for Rotorcraft Analysis **Se jong Oh (Pusan National University)**			
09:50-10:00	Coffee Break			
	[Convention Hall] Special Session : Combinatorial and Discrete Optimization II	**[Burano 1] Special Session : Medical Mathematics II**	**[Burano 2] Special Session : Existence, uniqueness, regularity and stability for PDEs related to fluids**	**[Burano 3] General Session**
	Chair: Dabeen Lee	**Chair: YunKyong Hyun**	**Chair: Kyungkeun Kang**	**Chair: Miyoun Jung**
10:00-10:20	Constant-Factor Approximation Algorithms for Parity-Constrained Facility Location Problems **Hyung-Chan An (Yonsei University)**	Automated ultrasound assessment of amniotic fluid volume using machine learning **Hyunchul Cho (Yonsei University)**	Geometric Parameterization Technique for a Reduced Basis Approximation of a Unit Cell Model **Kyunghoon Lee (Pusan National University)**	Learning to Trade in Financial Time Series through Wavelet Transformation and Deep Reinforcement Learning **Ji Min Lee (Yonsei University)**
10:20-10:40	On minimal highly connected spanning subgraphs in dense digraphs **Dong-yeap Kang (KAIST)**	GAN-based Data Normalization for Rubust Deep Learning **Min Gyu Lee (Yonsei University)**	Global well-posedness of the half space problem of the Navier-Stokes equations in critical function spaces of limiting case **Tongkeun Chang (Yonsei University)**	Fire Detection using Deep Learning in Surveillance Camera **Myeongho Jeon (Seoul National University)**
				Semantic Segmentation Network Based on Deep Learning for Outdoor Fire Image **Han-Soo Choi (Seoul National University)**
10:40-11:00	Stable sets in graphs with bounded odd cycle packing number **Tony Huynh (Monash University)**	Mathematical modeling of tuberculosis to evaluate vaccine strategies in Korea **Jonggul Lee (NIMS)**	Uniform stability of traveling waves for 1D viscous hyperbolic system of two conservation laws **Moon-Jin Kang (Sookmyung Women's University)**	An introduction to autonomous driving system in Korea and Pangyo **Soyoung Jung (Gyeonggi Autonomous Driving Center)**
11:00-11:20	Rank-width: Algorithmic and structural results **Sang-il Oum (KAIST)**	의료데이터를 활용한 기계학습 기반 예측모델 개발(사례 중심으로) **YunKyong Hyun (NIMS)**	Sharp Hölder estimates in corener domains and the incompressible Euler equations **In-Jee Jeong (KIAS)**	The Roles Of Non-Negative Weight Constraints In Graph Auto-Encoder (Gae): In Applications Over Brain Networks **Cheol E. Han (Korea University)**
11:20-11:30	[Convention Hall]	Ceremony for 2019 Outstanding Young Investigator Award		Chair: Eun-Jae Park
11:30-12:00	[Convention Hall]	Talk for 2019 Outstanding Young Investigator Award		Chair: Eun-Jae Park
	Inverse Problems on Electrical Bioimpedance **Hyeuknam Kwon (Yonsei University)**			
12:00-13:00	Lunch			
	[Convention Hall] Special Session : Recent advances in mathematical modeling of swarming	**[[Burano 1] Special Session : 불연속 Galerkin / High-Order methods for PDE**	**[[Burano 2] Special Session : Applied Algebra and Geometry**	**[Burano 3] General Session**
	Chair: Young-Pil Choi	**Chair: Hyung Taek Ahn**	**Chair: Kangjin Han**	**Chair: Myeongmin Kang**
13:00-13:20	Emergent behaviors of the swarmalator model for position--phase aggregation **Jeongho Kim (Seoul National University)**	Implicit discontinuous Galerkin scheme for shallow water equations with step bathymetry **Haegyun Lee (Dankook University)**	Rank 3 loci of surfaces of minimal degree **Euisung Park (Korea University)**	Pseudo-linear Convergence of an Additive Schwarz Method for the Dual Rudin--Osher--Fatemi Model **Jongho Park (KAIST)**
13:20-13:40	On the stochastic flocking of the Cucker-Smale flock with randomly switching topologies **Doheon Kim (KIAS)**	A Global Non-Hydrostatic Dynamical Core Using the Spectral Element Method on a Cubed-Sphere Grid **Suk-Jin Choi (KIAPS)**	Varieties constructed from binary quartic forms **KyungTae Lee (Konkuk University)**	Signal denoising on graph by local data approximation **Yeon Ju Lee (Konkuk University)**
				Non-iterative microwave imaging without background information **Won-Kwang Park (Kookmin University)**
13:40-14:00	Interplay of random inputs and adaptive couplings in the Winfree model **Bora Moon (Seoul National Univesrity)**	On the Minimization of Lebesgue Constant for Bivariate Tensor Product Polynomial Space on Square **Hojun You (Seoul National University)**	A bound for the real Waring rank of monomials **Hyungsuk Moon (NIMS)**	Role of tumor-associated neutrophils and NE in regulation of lung cancer growth and growth patterns **Jun Ho Lee (Konkuk University)**
14:00-14:20	Asymptotic behavior of a second-order swarm sphere model and its kinetic limit **Dohyun Kim (NIMS)**	P0 Space/Time Subcell Limiting DG-DGLM Method for Hyperbolic Conservation Laws **Jaemin Shin (Yonsei University)**	Local Fourier Coupled mode theory for parallel computation of large-scale optical field distribution **Hwi Kim (Korea University)**	Role of STAT1 and STAT3 signaling pathways in regulation of tumor growth in lung cancer development **Donggu Lee (Konkuk University)**

14:20-15:20	[Festa]	Poster	Chair: Jae-Myung Ahn

1. A Data-Driven Approach For A Macroscopic Conductivity Model Utilizing Finite Element Approximation / Jeon, Young Jae (Kyung Hee Univ.)

2. The pricing of vulnerable options under a hybrid stochastic volatility model / Kim, Donghyun (Pusan National Univ.)

3. Efficient mesh generation using an Body Centered Cubic mesh / Yang, Hee Jun (Kyung Hee Univ.)

4. Asymptotic analysis on stress concentration and Steklov-Dirichlet first eigenvalues for eccentric annuli / Hong, Jiho (KAIST)

5. Pattern formation on the moving surface / Kim, Hyundong (Korea Univ.)

6. 금융시장지수의 국내 주택매매시장 적용가능성 연구 / Woo, Jun-hui (Pusan National Univ.)

7. A Feature selection method based on topological aspect of feature manifolds / Park, Jungho (Seoul National Univ.)

8. A Feature selection method based on topological aspect of feature manifolds / Park, Jaemin (Seoul National Univ.)

9. Detecting Malaria Infection using Deep Learning / Choi, Myungje (Seoul National Univ.)

10. A Study on the Applicability of financial Market Index to Korea housing Market / LI QI (Pusan National Univ.)

11. Pricing Two-And Three-Asset ELS In Android Application / Lyu, Jisang (Korea Univ.)

12. Multiphase image segmentation using a simple PDE / Park, Jintae (Korea Univ.)

13. A series formula for inversion of Radon transform with optical Gaussian beam / Jeon, Kihyeon (Kyungpook National Univ.)

14. Phase-field simulation of ice melting / Lee, Chaeyoung (Korea Univ.)

15. Mathematical modeling of Ebola Virus Disease outbreak in the Republic of Korea / Ko, Youngsuk (Konkuk Univ.)

16. Photoacoustic Tomography With Line Detector / Kim, Juyeon (Kyungpook National Univ.)

17. A C0-Interior Penalty Method For The Stationary Quasi-Geostrophic Equation: A Posteriori Error Analysis / Kim, Dohyun (Yonsei Univ.)

18. Topological Data Analysis of Coronary Atherosclerosis / Kijm, Haneol (Seoul National Univ.)

19. Numerical simulation of shallow water equation / Go, Minji (Korea Univ.)

20. Numerical Study of Euler system with maximal density constraint / Cho, Inrae (Korea Univ.)

21. Extended Kalman Filter and Ensemble Kalman Filter / Kim, Jihyeon (Pusan National Univ.)

22. Finding The Shortest Path : Dijkstra's Algorithm and A* Algorithm / Kim, Soyeon (Pusan National Univ.)

23. Charecterization of p-scheme by using thin residue / ABBAS WASIM (Pusan National Univ.)

24. Optimal cost estimation for PV plant operation with tariff incentive / Mannan Jamshaid (Pusan National Univ.)

25. Generalizations of Inequalities For Polynomials Not Vanishing In A Disk / SHEIKH MOHD IBRAHIM (Pusan National Univ.)

26. Parameter estimation for Biology System / Meiyan Jiang (Pusan National Univ.)

27. 인공신경망을 이용한 미분방정식의 풀이 / Go woojin, Bok JinSeong (Sungkyunkwan Univ.)

28. 자료 동화 소개 / Cho, Eun Hae (Pusan National Univ.)

	[Convention Hall] Special Session : PDE modeling, numerical simulations and related applications	[Burano 1] Special Session : GeoMathematics and its applications	[Burano 2] Special Session : Fluid-Structure Interaction	[Burano 3] General Session
	Chair: Yunho Kim	Chair: Sangil Kim	Chair: Sang Joon Shin	Chair: Junseok Kim
15:20-15:40	Exact inversion formulas in Photoacoustic tomography with two geometries **Sunghwan Moon (Kyungpook National University)**	Optimal harvesting strategies for hairtail, Trichiurus Lepturus in Korea sea using discrete time age structured model based on nonlinear density-dependence with environmental factor **Yong Dam Jeong (Pusan National University)**	Fluid-Structure Interaction Analysis on Camber Effects of Flapping Micro Air Vehicles **Sanghoon Yoon (Seoul National University)**	불연속 Galerkin 스펙트럴 요소법을 이용한 새로운 Elliptic PDE 해법 **Hyung Taek Ahn (University of Ulsan)**
15:40-16:00	Non-iternative compact OS method for Allen-Cahn equation **Seunggyu Lee (Gyeongsang National University)**	동해 명태 산란장 및 성육장의 환경변화에 따른 난·자치어의 이동경로 변화 모의 **Yong-Yub Kim (Seoul National University)**	A Study about Fluid-Structure Interaction for Rotor Blades of a Floating Offshore Wind Turbine **Youngjin Kim (KAIST)**	A Practical Adaptive Grid Method for the Allen-Cahn Equation **Darae Jeong (Kangwon National University)**
16:00-16:20	Convervative Allen--Cahn equation for the boundedness of the order parameter **Dongsun Lee (UNIST)**	기후와 수산자원 : 명태와 오징어 **Chung Il Lee (Gangneung-Wonju National University)**	Accurate and Efficeint Fluid-structure Interaction Analysis using Reduced Order Models **Sihun Lee (Seoul National University)**	Energy stable methods for convex gradient problems **Jaemin Shin (Ewha Womans University)**
				Global well-posedness of the Navier-Stokes equations of an inhomogeneous fluid in the half space with inflow boundary condition **Bum Ja Jin (Mokpo National University)**
16:20-16:40	Accelerated Douglas-Rachford Operator Splitting Method for Variational Problems **Donghwan Kim (KAIST)**	Optimal Control Strategies for Chub Mackerel(Scomber japonicus) in South Korea **GeunSoo Jang (Pusan National University)**	Parameterized ROM using Artificial Neural Networks for Interaction between Incompressible Fluid and Moving Structure **Haeseong Cho (Jeonbuk National University)**	Invariance of the Neumann-Poincare spectrum under the Mobius transformation in two dimensions **Yong-Gwan Ji (Inha University)**

16:40-16:50	[Convention Hall]	Ceremony for Best Poster Award	Chair: Bongsoo Jang

9:00-11:00	[Convention Hall]	Panel Discussion II	Chair: Bongsoo Jang
	Future Agenda of Industrial and Applied Mathematics in Korea Kim, Chongam / Kang, Myungjoo / Shin, Sang Joon / Park, Eun-Jae		

Closing