KSIAM 2021 Spring Conference
Gangneung TopsTen Hotel, Gangneung, Korea
June 25-27, 2021

SCHEDULE

▶ Opening Ceremony June 25th, 13:50-14:00 [Grand Ballroom]
  - Lee, Chang-Ock (President of KSIAM)

▶ Plenary Talks
  ○ Zhang, Byoung-Tak (Computer Science and Engineering, Seoul National University)
    - Steps Toward Human-Level AI
    - June 25th, 14:00-14:50 [Grand Ballroom]
  ○ Hwang, Ganguk (Department of Mathematical Sciences, KAIST)
    - Bayesian Machine Learning With Gaussian Processes
    - June 26th, 09:30-10:20 [Grand Ballroom]

▶ KSIAM Young Researcher Paper Award : June 25th, 17:30-18:10 [Grand Ballroom]

▶ KSIAM Journal Excellent Article Award : June 26th, 13:30-14:10 [Grand Ballroom]

▶ Poster Session : June 25th, 16:40-17:20

▶ Special Sessions
  ○ AI Today in MATLAB
  ○ Applications of Mathematical Data Science in Industry
  ○ Biomedical Mathematics
  ○ Cell Motility
  ○ CJK-SIAM mini-symposium I : Emerging Mathematics in AI
  ○ CJK-SIAM mini-symposium II : Mathematical modeling of emerging infectious diseases
  ○ Mathematics of Geosciences
  ○ Medical Image Reconstruction and Analysis
  ○ Numerical Analysis and Machine Learning
  ○ Optimization and Machine Learning I, II
  ○ Recent Progress in Digital Dentistry integrating CBCT and Vision

▶ 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
13:00- Registration

13:14:00 Opening Ceremony
Chang-Ock Lee (President of KSIAM)

Chair: Hyung Ju Hwang

14:00- Plenary Talk 1
Byoung-Tak Zhang (Seoul National University)

Chair: Hyung Ju Hwang

14:50- Coffee Break

15:00- Special Session: Optimization and Machine Learning I

Chair: Donghwan Kim

15:00-16:20

AdamP: Slowdown of Momentum Optimizers on Scale-invariant Weights
Sanghyuk Chun (NAVER)

[Online] The Evolving Role of Artificial Intelligence in Biomedical Applications
Jun-Sang Eom (MathWorks)

Augmentation of orientation trueness of head CBCT radiographs by learning-based skull segmentation improves repeatability and accuracy of craniofacial analysis
Sung Min Lee (HDXWILL)

Staggered DG method with small edges for lesion in fractured porous media
Dohyun Kim (Yonsei University)

Irreversible investment decision problem with jumps on finite time horizon
Yoounhee Lee (Chungnam National University)

15:20-15:40

Nonlinear operator theory and fixed-point iterations
Ernest K. Ryu (Seoul National University)

[Online] AI in Finance Application
Kyu-Hwan Jang (MathWorks)

Individual tooth segmentation in 3D dental model using 2D full arch view
Tae Jun Jang (Yonsei University)

An expanded staggered DG for the heterogeneous diffusion equation
Sanghee Lee (Yonsei University)

Accurate and efficient computation of implied volatilities using neural network
Tae-Kyoung Kim (Chonnam National University)

15:40-16:00

Semi-Anchored Multi-Step Gradient Descent Ascent Method for Structured Nonconvex-Nonconcave Composite Minimax Problems
Sujeol Lee (KAIST)

[Online] Field equipment analytics: Anomaly detection in Power plant case
Jun-Sang Eom (MathWorks)

Fully automated individual tooth-based registration of intra-oral scan and CBCT data
Hye Sun Yun (Yonsei University)

Finite element approximation of an incompressible chemically reacting non-Newtonian fluid
Seungchan Ko (University of Hong Kong)

Extensive networks would eliminate the demand for pricing formulas
Ji-Suk Park (Chonnam National University)

16:00-16:20

Factor-\(\frac{1}{2}\) Acceleration of Accelerated Gradient Methods
Chanwoo Park (Seoul National University)

[Online] Deploying AI to Embedded and Enterprise Systems
Kyu-Chul Park (MathWorks)

Recent Progress in Advanced Cephalometry Environment
Kiwan Jeon (NIMS)

[Online] Successive finite element methods for Stokes equation
Jung Hee Park (Konkuk university)

Using feature pyramid information for weakly supervised object localization
Byounggeun Koo (Seoul National University)

16:20-16:40 Coffee Break

16:40-16:45

Stability Analysis of a Three-dimensional Host-parasitoid Model with Logistic Growth Function
Jia Liliao (Pusan National University)

Complexity analysis of integrable primal-dual interior point method for semidefinite optimization based on the new class of kernel functions
Jong-Kyu Lee (Pusan National University)

Information Maximizing Generative Adversarial Networks for Capacity Estimation Using Impedance of Lithium-Ion Batteries
Seongyoon Kim (Yonsei University)

Sensitivity and stability analysis of an Ebola Virus disease and GB virus C co-infection
Jung Yeon (Pusan National University)

Blood Flow in Cathereterized Artery
Javeed Shama (Pusan National University)

16:45-16:50

A study on Convolutional Neural Network for Classification of Brain Tumors
Daene Kim (Inha university)

Closed-form pricing formula for foreign equity option with credit risk
Donghyun Kim (Pusan National University)

Novel methods for effective household object classification using depth images
Jung-Eong Kil (Seoul National University)

The Pricing of Vulnerable Power Options with Double Merton Transforms
Mijn Ha, Qi Li (Pusan National University)

The effect of the awareness and treatment on HIV spread in developing and developed countries
Sajida Parveen (Pusan National University)

16:50-16:55

Particle Filter and Ensemble Kalman Filter for Stochastic ODE Systems
Seong Kim (Pusan National University)

CNN-based Prediction of Knee-point in Capacity Degradation of Li-Ion Batteries
Hangsoong Jung (Yonsei University)

Mathematical Modeling and Numerical Simulation of Lithium-Ion Batteries
Sanghyun Kim (Yonsei University)

Efficient immersed boundary projection method for heat transfer problems
Tiantian Xu (Yonsei University)

Particle Tracking Using LTRANS
DongHeon Seong, Mi Ji Kim (Pusan National University)

16:55-17:00

A Bayesian Deep Learning Framework For Uncertainty Quantification of Stochastic Partial Differential Equations
Jeahan Jung (POSTECH)

Effective Gradient Leakage for Model Inversion
Yea Chan Park (Seoul National University)

Particle filtering for stochastic Cessi-Young Equation
Meiyan Jiang (Pusan National University)

Spatial-temporal patterns of COVID-19 using dynamic mode decomposition
Minseok Kim (KyungHee University)

Personalized sleep-wake patterns aligned with circadian rhythm relieve daytime sleepiness
Seho Park (KAIST)
<table>
<thead>
<tr>
<th>Time</th>
<th>[Grand Ballroom]</th>
<th>[Blue]</th>
<th>[PDR]</th>
<th>[Conference]</th>
<th>[Junior]</th>
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<tbody>
<tr>
<td>17:00-17:05</td>
<td>Construction of a WENO scheme based on the exponential approximation space enhancing the third-order WENO scheme Kyungrok Lee (Yonsei University)</td>
<td>Singular value decomposition of the attenuated conical Radon transform with a fixed central axis and opening angle Ghyeon Jeon (Kyungpook National University)</td>
<td>Applications of the Particle Filter to the Double-Well Potential Model (DWPM) Azimov Sherzod Azzakhon Ugli (Pusan National University)</td>
<td>4D-Var Method with Lorenz 63 Model Eun Hae Cho (Pusan National University)</td>
<td>Korean Document Clustering by Topic Using Matrix Factorizations Juneho Lee (Pusan National University)</td>
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<tr>
<td>17:05-17:10</td>
<td>Distinguishing non-tuberculous mycobacteria lung disease and tuberculosis using deep learning Youjin Lee (Pusan National University)</td>
<td>Universally valid reduction of multiscale stochastic biochemical systems with simple non-elementary propensities Yun Min Song (KAIST)</td>
<td>Efficient training of pricing networks using Greeks Namjum Kim (Chonnam National University)</td>
<td>Web-Based Diagnostic Performance Comparison of Mobile phone and Computer through CNN in Diagnosing Thyroid Nodule on Ultrasonography Beomgi So (Yonsei University)</td>
<td>Effect on tumor growth in systems of two different types of tumor-associated neutrophils : A mathematical model Han Eol Cho (Konkuk University)</td>
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<tr>
<td>17:10-17:15</td>
<td>Optimal constant for generalized diagonal update method Jeong Hoon Ju (Pusan National University)</td>
<td>Data Assimilation : real-time forecasting Hand-Foot-and-Mouth Disease(HFMD) Sieun Lee (Pusan National University)</td>
<td>Development of a mathematical model for predicting accurate heretic clearance of drug Eun Han Goo (KAIST)</td>
<td>Benefits of the reward system in text generation Yedarm Seong (Seoul National University)</td>
<td>Understanding and Optimal Ensemble Size of Ensemble Kalman Filter via Lorenz Model GyoungMin Lim, Jihyeon Kim (Pusan National University)</td>
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<tr>
<td>17:15-17:20</td>
<td>A Study on the Effects of Isolation and Contact-Tracing Interventions for COVID-19 in South Korea Hohnyung Ryu (Kyung Hee University)</td>
<td>Composition - Aware Image Steganography through Adversarial Self-Generated Supervision Yuanmeng Hu (Pusan National University)</td>
<td>Designing optimizing procedure for task switching to ensure efficiency in the hospital laboratory Garam Kim (Technische Universität Berlin)</td>
<td>Data-based inference method reveals the network structure of the circadian clock Seokjoo Chae (KAIST)</td>
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<tr>
<th>Time</th>
<th>Coffee Break</th>
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<td>17:20-17:30</td>
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<tr>
<td>17:30-17:40</td>
<td>[Grand Ballroom] Deliver of Appreciation Plaques &amp; Ceremony for KSIAM Young Researcher Paper Award Chair: Dosang Joe</td>
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<tr>
<td>17:40-18:10</td>
<td>[Grand Ballroom] Talk for KSIAM Young Researcher Paper Award Chair: Dosang Joe</td>
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<td>Spatiotemporal stochastic modeling reveals a hidden compensation mechanism for robust daily rhythms Dae Wook Kim (KAIST)</td>
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<td>18:10-</td>
<td>Dinner</td>
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<td>Time</td>
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<tr>
<td>10:20-10:40</td>
<td>Coffee Break</td>
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<tr>
<td>11:00-11:20</td>
<td>Accelerated Algorithms for Smooth Convex-Concave Minimax Problems with $\lambda (1/e)$ Rate on Squared Gradient Norm TaeHo Yoon (Seoul National University)</td>
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<td>11:20-11:40</td>
<td>A Geometric Structure of Acceleration and Its Role in Making Gradients Small Fast Jongmin Lee (Seoul National University)</td>
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<td>11:40-12:00</td>
<td>Proximity Operator of the Matrix Perspective Function and Its Applications Joong-Ho Won (Seoul National University)</td>
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<td>12:00-13:30</td>
<td>Lunch</td>
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<td>13:40-14:10</td>
<td>[Grand Ballroom] Talk for KSIAM Journal Excellent Article Award</td>
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<td>14:10-14:30</td>
<td>Coffee Break</td>
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<td>14:30-14:50</td>
<td>WGAN with an infinitely wide generator has no spurious stationary points</td>
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<td>14:50-15:10</td>
<td>[Online] Variational Training of Neural Network Approximations of Solution Maps for Physical Models Yingzhou Li (Fudan University)</td>
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<tr>
<td>15:10-15:30</td>
<td>[Online] Variational Training of Neural Network Approximations of Solution Maps for Physical Models Yingzhou Li (Fudan University)</td>
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## KSIAM 2021
### Spring Conference
#### June 26 (SAT) Session

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>15:50-16:10</td>
<td>Coffee Break&lt;br&gt;Chair: Chang Hyeong Lee (Grand Ballroom)</td>
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<tr>
<td>16:10-16:30</td>
<td>Forecasting the spread of COVID-19 according to the effect of interventions in Republic of Korea&lt;br&gt;Hyojung Lee (NIMS)&lt;br&gt;How do flagellated bacteria swim?&lt;br&gt;Sookkyung Lim (University of Cincinnati)&lt;br&gt;SWE conservational error caused by geometric approximation error on the spherical earth&lt;br&gt;Sehun Chun (Yonsei University)&lt;br&gt;Chair: Wanho Lee (Blue Special Session: Cell Motility)</td>
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<tr>
<td>16:30-16:50</td>
<td>Multi-scale mathematical models of the COVID-19 pandemic&lt;br&gt;Yanni Xiao (Xi'an Jiaotong University)&lt;br&gt;Computational simulation of E. coli propelled by bacterial flagella&lt;br&gt;Lee, Wanho (NIMS)&lt;br&gt;Modeling of Jet Streams and Polar Vortex on a Rotating Sphere&lt;br&gt;Sung-Ik Sohn (Gangneung-Wonju National University)&lt;br&gt;Chair: Sung-Ik Sohn (Special Session: Mathematics of Geosciences)</td>
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<td>16:50-17:10</td>
<td>A Simple Mathematical Model On Spread of COVID-19 and Its Application to JAPAN&lt;br&gt;Takashi Tsuchiya (National Graduate Research Institute for Policy Studies)&lt;br&gt;Collective migration of glioma cells through signaling in the presence and absence of reactive astrocytes and stem cells after surgery&lt;br&gt;Yangjin Kim (Konkuk University)&lt;br&gt;Data Assimilation : Predicting the Unpredictable&lt;br&gt;Sangil Kim (Pusan National University)&lt;br&gt;Chair: Kwang-Yeon Kim (Junior General Session 7)</td>
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<tr>
<td>17:10-17:30</td>
<td>A linear nonlocal model for outbreak of COVID-19 and parameter identification&lt;br&gt;Jin CHENG (Fudan University)&lt;br&gt;[Online] 세포 군집 이동을 모사하기 위한 연속체역학 기반 유한요소 모델링&lt;br&gt;Hyungmin Jun (Jeonbuk National University)&lt;br&gt;Sea level rise estimation near the Korean peninsula using CEEMDAN with tidal data&lt;br&gt;Young Jin Kim (NIMS)&lt;br&gt;Chair: Youngjoon Hong (San Diego State University)</td>
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<td>17:30-17:40</td>
<td>[Online] 인공신경망 기반 극초음속 경계층 선형 불안정성 예측 연구&lt;br&gt;Jaeyoung Park (Pusan National University)</td>
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### June 27 (SUN) Session
#### 9:00-11:00 | Panel Discussion<br>Chair: Sunmi Lee<br>Future of KSIAM<br>Chang-Ock Lee / Hyung Ju Hwang / Jin Yeon Cho / Dosang Joe<br>Closing