Special Session 1

Special Session Title: Bilevel Optimization and Augmented Lagrangian method

Session Organizers' Names and Affiliations: Xinwei Liu, Hebei University of Technology

Corresponding Organizer's Email: mathlxw@hebut.edu.cn

Special Session Introduction: Nonlinear optimization widely exists in various fields such as scientific computing, engineering design, and economic analysis, while global optimization aims to break through the limitations of local optimal solutions and seek the global optimum of problems. This report in-depth analyzes the core theories of nonlinear optimization, including the properties of convex/non-convex optimization, optimality conditions, and local solution algorithms, with a focus on the theoretical basis and key technologies of global optimization. It also concentrates on the design and improvement of efficient algorithms, covering deterministic algorithms, stochastic optimization algorithms, and hybrid strategies. It analyzes the performance and applicability of different algorithms in handling high-dimensional, non-smooth, and multi-extremal problems, and demonstrates the core ideas and practical effects of algorithm design through specific cases.

Session Papers/Abstracts Includes:

1. Title: A Surrogate Value Function Formulation for Bilevel Optimization

All Authors' Names and Affiliations: Mengwei Xu, Yu-Hong Dai, Xin-Wei Liu, Meiqi Ma

Presenter's Name: Mengwei Xu

2. Title: A Parameterized Fritz-John Reformulation and Robust SQP Algorithm for Bilevel Optimization

All Authors' Names and Affiliations: Meiqi Ma,Mengwei Xu, Xin-Wei Liu

Presenter's Name: Meiqi Ma

3. Title: A path-following smoothing Newton method with polynomial iteration complexity for symmetric cone programming

All Authors' Names and Affiliations: Zhang Ruijin (Nankai University), Diao Ruoyu（Academy of Mathematics and Systems Science, Chinese Academy of Sciences）, Liu Xinwei (Hebei University of Technology), Dai Yuhong（Academy of Mathematics and Systems Science, Chinese Academy of Sciences）

Presenter's Name: Zhang Ruijin

4. Title: Extended Recovery Theory and Efficient Computation for Robust Convex Clustering with Huber Loss

All Authors' Names and Affiliations: Xiangru Xing, Xianchao Xiu, Huangyue Chen, and Lingchen Kong

Presenter's Name: Xiangru Xing

Special Session 2

Special Session Title: Dynamical Systems and Optimization Algorithms

Session Organizers' Names and Affiliations: Xiangkai Sun Chongqing Technology and Business University

Corresponding Organizer's Email: sunxk@ctbu.edu.cn

Special Session Introduction: In recent years, second-order dynamics approaches have emerged as active and popular topics within the optimization community. Second-order dynamical systems not only offer profound insights into accelerated algorithms but also generate new accelerated algorithms through various discretization schemes. This special session aims to provide a single platform for researchers to gather and present their inspiring research findings and ideas for knowledge transfer in the fields of dynamical systems and optimization algorithms.

Session Papers/Abstracts Includes:

1. Title: Accelerated primal-dual methods for linearly constrained optimization in continuous and discrete time

All Authors' Names and Affiliations: Xin He, Xihua University

Presenter's Name: Xin He

2. Title: On the $o(1/k^2)$ convergence rate analysis for some inertial methods

All Authors' Names and Affiliations:

1) Tanxing Wang: School of Mathematical Sciences, Beihang University, Beijing 100191, China;

2) Xingju Cai: School of Mathematical Sciences, Ministry of Education Key Laboratory of NSLSCS, Nanjing Normal University, Nanjing 210023, China;

3) Deren Han: School of Mathematical Sciences, Beihang University, Beijing 100191, China;

4) Ting Li: School of Mathematical Sciences, Beihang University, Beijing 100191, China

Presenter's Name: Tanxing Wang

3. Title: Primal-dual dynamical system with closed-loop control for constrained convex optimization in continuous and discrete time.

All Authors' Names and Affiliations:

1) Huan Zhang, College of Mathematics and Statistics, Chongqing University, Chongqing 401331, China.

2) Xiangkai Sun, Chongqing Key Laboratory of Social Economy and Applied Statistics, College of Mathematics and Statistics, Chongqing Technology and Business University, Chongqing 400067, China.

3) Shengjie Li, College of Mathematics and Statistics, Chongqing University, Chongqing 401331, China.

4) Kok Lay Teo, School of Mathematical Sciences, Sunway University, Bandar Sunway, 47500 Selangor Darul Ehsan, Malaysia.

Presenter's Name: Huan Zhang

Special Session 3

Special Session Title: Advanced deterministic and stochastic optimization methods

Session Organizers' Names and Affiliations:

Jianchao Bai (Northwestern Polytechnical University)

Zhongming Wu (Nanjing University of Information Science and Technology)

Corresponding Organizer's Email:

Jianchaobai@nwpu.edu.cn, wuzm@nuist.edu.cn

Special Session Introduction: This session focuses on the latest advances, innovations, and applications of advanced deterministic and stochastic optimization methods. Deterministic optimization, characterized by precise parameter settings and rigorous solution frameworks, plays a crucial role in addressing complex decision-making problems with well-defined constraints. Meanwhile, stochastic optimization effectively copes with uncertainties inherent in real-world systems, such as random demands, fluctuating parameters, and incomplete information, providing robust solutions for dynamic and unpredictable environments. We aim

to gather academia and industry researchers to present latest advances, share innovative ideas, and promote interdisciplinary exchanges between theoretical developments and practical applications. Key topics include but are not limited to: theoretical foundations (subdifferential calculus, optimality conditions, complexity bounds); advanced algorithms (proximal-type methods, ADMM-type methods, primal-dual methods, stochastic and distributed optimization); applications in machine learning (deep learning, federated learning), high-dimensional data analysis, signal processing, and engineering design, as well as numerical implementation and software development.

Session Papers/Abstracts Includes:

1. Title: Geometry-Driven Precondition for Douglas-Rachford Splitting Method

All Authors' Names and Affiliations: Yuting Shen (Shanghai Jiao Tong University), Jingwei Liang (Shanghai Jiao Tong University)

Presenter's Name: Jingwei Liang

2. Title: On the Convergence of Gearhart-Koshy Accelerated Kaczmarz Method for Tensor Linear Systems

All Authors' Names and Affiliations: Yijie Wang (Beihang University), Yonghan Sun (Beihang University), Deren Han (Beihang University), Jiaxin Xie (Beihang University)

Presenter's Name: Jiaxin Xie

3. Title: Scalable Differentiable Optimization via Smooth Approximation

All Authors' Names and Affiliations: Yuxuan Linghu (Shanghai Jiaotong University), Zhiyuan Liu (Shanghai Jiaotong University), Qi Deng (Shanghai Jiaotong University)

Presenter's Name: Qi Deng

4. Title: Effective Algorithms for Optimal Portfolio Selection with Relative Marginal Risk Constraints

All Authors' Names and Affiliations: Hezhi Luo (Zhejiang Normal University), Huixian Wu(Hangzhou Dianzi University), Guoqiang Wang(Shanghai University of Engineering Science)

Presenter's Name: Hezhi Luo

5. Title: Retraction-free Optimization over the Stiefel Manifold with Application to the LoRA Fine-tuning

All Authors' Names and Affiliations: Yuan Zhang (JD), Zhijian Lai (Peking University), Jiang Hu (Tsinghua University), Lin Lin (UC Berkeley), Zaiwen Wen (Peking University)

Presenter's Name: Jiang Hu

6. Title: An Accelerated Primal-dual Flow for Linearly Constrained Multiobjective Optimization

All Authors' Names and Affiliations: Hao Luo (Chongqing Normal University), Qiaoyuan Shu (Chongqing Normal University), Xinmin Yang (Chongqing Normal University)

Presenter's Name: Hao Luo

Special Session 4

Special Session Title: Recent advances in stochastic and constrained optimization

Session Organizers' Names and Affiliations: Qi Deng, Shanghai Jiao Tong University

Corresponding Organizer's Email: qdeng24@sjtu.edu.cn

Special Session Introduction: As modern machine learning and AI models grow in complexity, developing efficient methods to handle stochasticity, nonsmoothness, and complex constraints has become paramount. This session highlights the latest algorithmic breakthroughs in stochastic and constrained optimization. Collectively, these works offer new perspectives on convergence complexity, algorithmic efficiency, and practical implementation in high-dimensional and large-scale AI applications.

Session Papers/Abstracts Includes:

1. Title: Stochastic Nonsmooth Nonconvex-Concave Minimax Optimization

All Authors' Names and Affiliations: Jinyang Shi (School of Mathematical Science, Fudan University), Luo Luo (School of Data Science, Fudan University)

Presenter's Name: Luo Luo

2. Title: Adaptive directional decomposition methods for nonconvex constrained optimization

All Authors' Names and Affiliations: Qiankun Shi (Sun Yat-sen University) and Xiao Wang (Sun Yat-sen University)

Presenter's Name: Xiao Wang

3. Title: ripALM: A Relative-type Inexact Proximal Augmented Lagrangian Method

All Authors' Names and Affiliations: Lei Yang, Jiayi Zhu, Ling Liang, and Kim-Chuan Toh

Presenter's Name: Lei Yang

4. Title: ESSAM: A Novel Competitive Evolution Strategies Approach to Reinforcement Learning for Memory Efficient LLMs Fine-Tuning

All Authors' Names and Affiliations: Zhishen Sun (XJTU), Sizhe Dang (XJTU), Guang Dai (National Grid), Haishan Ye (XJTU)

Presenter's Name: Haishan Ye

Special Session 5

Special Session Title: Modern Trends in Constrained Optimization: Theory, Computation, and Applications

Session Organizers' Names and Affiliations: Wenhao Fu, Suzhou University of Science and Technology

Corresponding Organizer's Email: wenhfu@usts.edu.cn

Special Session Introduction: This session explores the latest trends in constrained optimization, bridging rigorous theoretical analysis with efficient computation and real-world applications. We start with a discussion on new sequential linear complementarity methods for generalized Nash equilibrium problems, followed by a look at a natural SQP algorithm designed to handle potentially infeasible subproblems in nonlinear optimization. We then demonstrate how quaternion matrix factorization is pushing the boundaries of color image restoration. The session concludes by exploring innovative stochastic augmented Lagrangian methods that boost convergence speeds for large-scale challenges.

Session Papers/Abstracts Includes:

1. Title: A sequential linear complementarity problem method for generalized Nash equilibrium problems

All Authors' Names and Affiliations:

1) Ruoyu Diao, Academy of Mathematics and Systems Science;

2) Yu-Hong Dai, Academy of Mathematics and Systems Science;

3) Liwei Zhang, Northeastern University

Presenter's Name: Ruoyu Diao (刁若愉)

2. Title: A natural SQP method with potentially infeasible subproblems for nonlinear optimization

All Authors' Names and Affiliations:

1) Wenhao Fu, Suzhou University of Science and Technology;

2) Yu-Hong Dai, Academy of Mathematics and Systems Science

Presenter's Name: Wenhao Fu (付文豪)

3. Title: Quaternion Matrix Completion with Quasi-Nonnegative Constraints and Sparsity for Color Image Restoration

All Authors' Names and Affiliations:

1) Chun Xiao, Yunnan University;

2) Shiyue Tang, Fujian Normal University;

3) Chengliang Li, Yunnan University;

4) Yifen Ke, Fujian Normal University;

5) Yajun Xie, Fuzhou University of International Studies and Trade

Presenter's Name: Chengliang Li (李成梁)

4. Title: Stochastic augmentation Lagrange algorithm for large scale linear constrained convex optimization problems

All Authors' Names and Affiliations:

1) Ting Li, Jiangsu Normal University;

2) Xingju Cai, Nanjing Normal University;

3) Deren Han, Beihang University

Presenter's Name: Ting Li (李婷)

Special Session 6

Special Session Title: Large-scale Optimization and Applications

Session Organizers' Names and Affiliations: Xianchao Xiu, Shanghai University; Lili Pan, Shandong University of Science and Technology

Corresponding Organizer's Email: xcxiu@shu.edu.cn, panlili1979@163.com

Special Session Introduction: With the rapid development of artificial intelligence, large-scale optimization is becoming increasingly important. This special session invites young scholars in

the field of large-scale optimization to exchange their latest research results. Discussion topics include dynamic optimal transport, low-rank tensor optimization, high-dimensional quantile regression, and sparse support vector machines.

Session Papers/Abstracts Includes:

1. Title: An Efficient Second-order Cone Programming Approach for Dynamic Optimal Transport on Staggered Grid Discretization

All Authors' Names and Affiliations: Liang Chen (Hunan University), Youyicun Lin (Hunan University), Yuxuan Zhou (Southern University of Science and Technology,)

Presenter's Name: Liang Chen

2. Title: From Explicit Regularization to Implicit Priors: Image Reconstruction Algorithms Based on Nonlocality and Low-rankness

All Authors' Names and Affiliations: Qiyu Jin, Inner Mongolia University

Presenter's Name: Qiyu Jin

3. Title: Riemannian Inexact Hybrid Stochastic Proximal Gradient Method for Low Rank and Group Sparse Stochastic Tensor Optimization

All Authors' Names and Affiliations: Xiongwei Guo (School of Mathematics and Statistic, Beijing Jiaotong University, Beijing 100044, China); Ziyan Luo (School of Mathematics and Statistic, Beijing Jiaotong University, Beijing 100044, China)

Presenter's Name: Ziyan Luo

4. Title: Effective Sparsity Minimization via Normalized Entropy

All Authors' Names and Affiliations: Haoyu He, Jiashan Wang, HaoWang (ShanghaiTech University), Hao Zeng

Presenter's Name: Hao Wang

5. Title: High-dimensional Composite Quantile Regression based Integrative Analysis with Homogeneity and Sparsity Recovery

All Authors' Names and Affiliations: Xin Wang, Zhaoqilin Yang, Hongxin Zhao, Lingchen Kong, Beijing Jiaotong University

Presenter's Name: Xin Wang

6. Title: Local Duality for Sparse Support Vector Machines

All Authors' Names and Affiliations: Penghe Zhang (The Hong Kong Polytechnic

University), Naihua Xiu (Beijing Jiaotong University), Houduo Qi (The Hong Kong Polytechnic University)

Presenter's Name: Penghe Zhang

Special Session 7

Special Session Title: Nonlinear programming and complementarity problems

Session Organizers' Names and Affiliations: Xiaoni Chi, Guilin University of Electronic Technology

Corresponding Organizer's Email: chixiaoni@126.com

Special Session Introduction: Nonlinear programming and complementarity problems provide powerful tools for modeling and solving complex decision-making problems in economics, engineering, and and sciences. This section contains four talks in contemporary trends in tensor, bilevel programs and complementarity problems. The contributions explore various aspects, including Gaussian-noise-robust tensor completion, a large-update interior-point algorithm for $P_*(\kappa)$ linear complementarity problem, regularized convex optimization methods for two-stage stochastic bilevel programs, and a corrector-predictor feasible interior-point algorithm for P∗(κ)-weighted linear complementarity problem.

Session Papers/Abstracts Includes:

1. Title: Gaussian-Noise-Robust Tensor Completion with Nonconvex Low-Rank and Capped Schatten-p Norm Sparse Regularization

All Authors' Names and Affiliations: Zhechen Zhang, Sanyang Liu, School of Mathematics and Statistics, Xidian University, Xi'an, Shaanxi, 710126, China

Presenter's Name: Zhechen Zhang

2. Title: A Large-update Interior-point Algorithm for $P_*(\kappa)$ Linear Complementarity Problem Based on a New Class of Hyperbolic Kernel Functions

All Authors' Names and Affiliations: Le Ma, Anhui Institute of Information Technology; Mingwang Zhang, Anhui Institute of Information Technology, China Three Gorges University.

Presenter's Name: Le Ma

3. Title: Regularized Convex Optimization Methods for Two-Stage Stochastic Bilevel

Programs with P_0 and Z Matrix Linear Lower-Level Constraints

All Authors' Names and Affiliations:

1) Ruonan Zheng, Nanchang University;

2) Zhenhua Peng, Nanchang University;

3) Yibing Lv, Yangtze University

Presenter's Name: Zhenhua Peng

4. Title: A corrector-predictor feasible interior-point algorithm for P∗(κ)-weighted linear complementarity problem based on the algebraic equivalent transformation

All Authors' Names and Affiliations:

Xiaoni Chi，School of Mathematics and Computing Science, Guilin University of Electronic Technology, Guilin 541004, Guangxi, P.R. China；

Guoqiang Wang, School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science, Shanghai 201620, P.R. China

Presenter's Name: Xiaoni Chi

Special Session 8

Special Session Title: Optimization Algorithms and Machine Learning

Session Organizers' Names and Affiliations:

(1) Xingju Cai, Nanjing Normal University

(2) Xue Gao, Hebei University of Technology

Corresponding Organizer's Email: xgao@hebut.edu.cn

Special Session Introduction: This special session focuses on the latest research advances at the intersection of optimization theory and machine learning. As ML models grow increasingly complex and large-scale, the demand for robust, efficient, and theoretically sound optimization algorithms has reached unprecedented levels. This session brings together cutting-edge research that addresses core challenges in modern ML through innovative algorithmic designs, including operator splitting methods, augmented Lagrangian frameworks, and their applications in distributed and federated learning scenarios.

Session Papers/Abstracts Includes:

1. Title: A class of parallel splitting proximal ALM with optimal step sizes

All Authors' Names and Affiliations:

1) Fan Jiang, Nanjing University of Information Science and Technology

2) Bingyan Lu, Nanjing University of Information Science and Technology

3) Hongchao Zhang, Louisiana State University

Presenter's Name: Fan Jiang

2. Title: Distributed optimization algorithm based on hypergraph networks with applications

All Authors' Names and Affiliations:

1) Jingya Chang, Guangdong University of Technology

2) Yijie Wang, Guangdong University of Technology

Presenter's Name: Jingya Chang

3. Title: A decentralized mirror for centralized learning: Unifying FL with inexact Douglas Rachford splitting method

All Authors' Names and Affiliations:

1) Leyu Hu, Nanjing Tech University

2) Yongxin Chen, Beihang University

3) Xingju Cai, Nanjing Normal University

4) Deren Han, Beihang University

Presenter's Name: Leyu Hu

4. Title: Bregman-augmented Lagrangian method for nonconvex nonsmooth optimization with general inequality constraints

All Authors' Names and Affiliations:

1) Xue Gao, Hebei University of Technology

2) Xingju Cai, Nanjing Normal University

3) Xinwei Liu, Hebei University of Technology

4) Deren Han, Beihang University

Presenter's Name: Xue Gao

Special Session 9

Special Session Title: Modern Optimization Techniques for Complex Systems and Data-

Driven Modeling

Session Organizers' Names and Affiliations: Lei Wang, School of Mathematical Sciences, Dalian University of Technology

Corresponding Organizer's Email: wanglei@dlut.edu.cn

Special Session Introduction: Optimization theory and mathematical modeling play a pivotal role in addressing intricate challenges across diverse scientific and engineering disciplines. This special session aims to bring together researchers to present and discuss recent advancements in optimization techniques and their interdisciplinary applications. The session encompasses a broad spectrum of research, ranging from foundational mathematical theories to complex system controls and data-driven modeling. Specifically, the session will feature discussions on achieving exponential synchronization in discrete-time complex dynamical networks utilizing event-triggered delayed impulsive control strategies. It will also delve into the theoretical aspects of convex-concave minimax optimization, investigating the continuity of approximate saddle point sets under parameter perturbations with applications to two-person zero-sum games. Furthermore, the session bridges optimization with theoretical ecology by introducing innovative plant fitness optimization models in water-limited environments to explain species coexistence patterns. Finally, the session will address data fusion challenges by presenting a novel conformal prediction framework for multi-fidelity data, which effectively quantifies uncertainty and provides stable prediction intervals. Ultimately, this session provides a collaborative platform to explore how advanced optimization frameworks can be leveraged to solve complex problems in dynamic networks, game theory, theoretical ecology, and data science.

Session Papers/Abstracts Includes:

1. Title: Synchronization of discrete-time complex networks with transmission delays via event-triggered impulsive control

All Authors' Names and Affiliations: Zhihui Ma(College of Sciences, Shihezi University), Mingsong Cheng, Lei Wang(School of Mathematical Sciences, Dalian University of Technology), Kok Lay Teo (School of Mathematical Sciences, Sunway University), Chen Wu (School of Mathematical and Big Data, Anhui University of Science and Technology)

Presenter's Name: Zhihui Ma

2. Title: Continuity of approximate saddle point set under parameter perturbations

All Authors' Names and Affiliations: Bin Yao (College of Science, Shihezi University), Yan-Cheng Wang, Xiao-Bing Li (College of Mathematics and Statistics, Chongqing Jiaotong University)

Presenter's Name: Bin Yao

3. Title: Study on three plant fitness optimization models based on water-limited resources

All Authors' Names and Affiliations: Zhi-quan Han; Chang Liu College of Life Science, Shihezi University, Shihezi 832000, Xinjiang, China

Presenter's Name: Zhi-quan Han

4. Title: Conformal Prediction Framework for Multi-fidelity Data Fusion

Presenter's Name: Baofei Xia

Special Session 10

Special Session Title: Intelligent decision-making for autonomous systems

Session Organizers' Names and Affiliations: Lei Wang (School of Mathematical Science, Dalian University of Technology, Dalian 116024, China)

Corresponding Organizer's Email: wanglei@dlut.edu.cn

Special Session Introduction: As autonomous systems become increasingly prevalent, the ability to make real-time, intelligent decisions in complex and dynamic environments has emerged as a critical challenge. Key topics of the session include real-time trajectory planning for autonomous driving, robust mission planning for UAV swarms, and efficient aircraft dispatching scheduling. The discussions will center on the optimization frameworks underpinning these applications, such as combinatorial optimization, optimal control, and multi-agent coordination under uncertainty. By bridging the gap between theoretical operations research and practical engineering constraints, this session aims to highlight the pivotal role of intelligent decision-making in enhancing the safety, efficiency, and reliability of future autonomous systems.

Session Papers/Abstracts Includes:

1. Title: Collision avoidance modeling in optimization base motion planning via embodied footprints

All Authors' Names and Affiliations: Bai Li (School of Information and Electronic Engineering, East China Normal University, Shanghai 200241, China)

Presenter's Name: Bai Li

2. Title: A heuristic algorithm for solving the time-dependent neighborhood close enough traveling salesman problem

All Authors' Names and Affiliations: Lan Peng, Xueqi Wang (School of Management, Shanghai University, Shanghai, China)

Presenter's Name: Lan Peng

3. Title: Autonomous sortie scheduling for carrier aircraft fleet under towing mode

All Authors' Names and Affiliations: Zhilong Deng (1), Lei Wang (2), Xinwei Wang (1) (1. State Key Laboratory of Structural Analysis, Optimization and CAE Software for Industrial Equipment, Dalian University of Technology, Dalian 116024, China; 2. School of Mathematical Science, Dalian University of Technology, Dalian 116024, China)

Presenter's Name: Xinwei Wang

4. Title: Resilient multi-objective mission planning for UAV formation: A unified framework integrating task pre- and re-assignment

All Authors' Names and Affiliations: Xinwei Wang(1), Xiaohua Gao(2*), Lei Wang(3), Xichao Su(4), Junhong Jin(3), Xuanbo Liu(3), Zhilong Deng(1).

(1. Department of Engineering Mechanics, State Key Laboratory of Structural Analysis, Optimization and CAE Software for Industrial Equipment, Dalian University of Technology, Dalian, China; 2. School of Mathematics and Big Data, Anhui University of Science and Technology, Huainan, China; 3. School of Mathematical Science, Dalian University of Technology, Dalian, China; 4. Department of Airborne Vehicle Engineering, Naval Aeronautical and Astronautical University, Yantai, China)

Presenter's Name: Xiaohua Gao

Special Session 11

Special Session Title: Polynomial Optimization with its applications in data science I

Session Organizers' Names and Affiliations:

Jinyan Fan (Shanghai Jiao Tong University)

Xindong Tang (Hong Kong Baptist University)

Anwa Zhou (Shanghai University)

Suhan Zhong (Shanghai Jiao Tong University)

Corresponding Organizer's Email: suzhong@sjtu.edu.cn

Special Session Introduction:

This special session focuses on the growing synergy between polynomial optimization (PO) and data science. While many data science tasks are plagued by non-convexity, PO provides a powerful toolkit to find globally optimal solutions for a wide range of problems.We invite talks that bridge the gap between PO theory and data science practice. Topics of interest include, but are not limited to: tensor completion, fractional optimization, Gromov Wasserstein problem, etc.

Session Papers/Abstracts Includes:

1. Title: Robust Completion for Rank-1 Tensors with Noises

All Authors' Names and Affiliations: Jiawang Nie (University of Califronia San Diego), Xindong Tang (Hong Kong Baptist University), Jinling Zhou (Xiangtan University)

Presenter's Name: Jinling Zhou

2. Title: Optimization with polynomials in diverse forms

All Authors' Names and Affiliations: Victor Magron (CNRS-LAAS), Jean B. Lasserre (CNRS-LAAS), Jared Miller (ETH Zurich), Feng Guo (Dalian University of Technology), Jie Wang (CAS-AMSS)

Presenter's Name: Jie Wang

3. Title: Progressive Bound Strengthening via Doubly Nonnegative Cutting Planes for Nonconvex Quadratic Programs

All Authors' Names and Affiliations: Zheng Qu (Shenzhen University), Defeng Sun (The Hong Kong Polytechnic University), Jintao Xu (The Hong Kong Polytechnic University),

Presenter's Name: Zheng Qu

4. Title: Positivstellensatz for polynomial matrices with universal quantifiers

All Authors' Names and Affiliations: Feng Guo (Dalian University of Technology), Jie Wang (AMSS)

Presenter's Name: Feng Guo

Special Session 12

Special Session Title: Polynomial Optimization with its applications in data science II

Session Organizers' Names and Affiliations:

Jinyan Fan (Shanghai Jiao Tong University)

Xindong Tang (Hong Kong Baptist University)

Anwa Zhou (Shanghai University)

Suhan Zhong (Shanghai Jiao Tong University)

Corresponding Organizer's Email: suzhong@sjtu.edu.cn

Special Session Introduction: This special session focuses on the growing synergy between polynomial optimization (PO) and data science. While many data science tasks are plagued by non-convexity, PO provides a powerful toolkit to find globally optimal solutions for a wide range of problems.We invite talks that bridge the gap between PO theory and data science practice. Topics of interest include, but are not limited to: tensor completion, fractional optimization, Gromov Wasserstein problem, etc.

Session Papers/Abstracts Includes:

1. Title: A Fixed-Point Methods for Sum-of-Ratios Minimization

All Authors' Names and Affiliations: Jinyan Fan (Shanghai Jiao Tong University), Xinyue Wang (Shanghai Jiao Tong University)

Presenter's Name: Xinyue Wang

2. Title: Sum-of-squares for the Gromov Wasserstein Problem

All Authors' Names and Affiliations: Hoang Anh Tran (Norwegian University of Science and Technology), Binh Tuan Nguyen (VinUniversity), Yong Sheng Soh (National University of Singapore)

Presenter's Name: Yong Sheng Soh

3. Title: A Disjunctive Approach for Generalized Semi-Infinite Programs with Polyhedral Parameter sets

All Authors' Names and Affiliations: Xiaomeng Hu (San Diego State University), Jiawang Nie (University of California, San Diego), Suhan Zhong (Shanghai Jiao Tong University)

Presenter's Name: Suhan Zhong

4. Title: Max-Min Bilinear Completely Positive Programs: A Semidefinite Relaxation with Tightness Guarantees

All Authors' Names and Affiliations: Sarah Yini Gao (Singapore Management University), Xindong Tang (Hong Kong Baptist University), Yancheng Yuan (The Hong Kong Polytechnic University)

Presenter's Name: Xindong Tang

Special Session 13

Special Session Title: Stochastic Optimization and Equilibrium

Session Organizers' Names and Affiliations: Jie Jiang, Chongqing University

Corresponding Organizer's Email: jiangjiecq@163.com

Special Session Introduction: Stochastic optimization has become a cornerstone of modern computational science and operations research, driven by the ubiquity of uncertainty in real-world data and environments. This special session aims to bring together some PhD students to discuss the latest developments or breakthroughs in the theory and algorithms of stochastic optimization, whose issues include distributionally robust optimization, stochastic multi-objective optimization, differential stochastic equilibrium and multistage stochastic programming.

Session Papers/Abstracts Includes:

1. Title: Bayesian distributionally robust variational inequalities: regularization and quantification

All Authors' Names and Affiliations: Wentao Ma, Department of Applied Mathematics, The Hong Kong Polytechnic University

Presenter's Name: Wentao Ma

2. Title: First-Order Algorithms for Stochastic Multi-objective Optimization Problems

All Authors' Names and Affiliations: Yiyang Li, Department of Applied Mathematics, The Hong Kong Polytechnic University

Presenter's Name: Yiyang Li

3. Title: Ultraspherical Spectral Gauss--Seidel Solvers with Smooth Fischer--Burmeister Homotopy for Differential Stochastic Linear Complementarity Problems

All Authors' Names and Affiliations: DUAN Junchao, Department of Applied Mathematics, The Hong Kong Polytechnic University; CHEN Xiaojun, Department of Applied Mathematics, The Hong Kong Polytechnic University

Presenter's Name: DUAN Junchao

4. Title: A Single-Loop Minorized Dual Method with Symmetric Gauss-Seidel Inexact ADMM for Nonsmooth Multi-stage Stochastic Programming

All Authors' Names and Affiliations: Dan Luo (Nanjing Normal University); HaiLin Sun (Nanjing Normal University); Lei Yang (Sun Yat-sen University); Yang You (Nanjing Normal University)

Presenter's Name: Dan Luo

Special Session 14

Special Session Title: Optimization Models and Algorithms in Statistical Learning

Session Organizers' Names and Affiliations: Yunhai Xiao, Center for Applied Mathematics of Henan Province, Henan University; Can Wu, School of Mathematics and Statistics, Hainan University

Corresponding Organizer's Email: wucan-opt@hainanu.edu.cn

Special Session Introduction: This special session focuses on recent advances in optimization models and algorithms that underpin modern statistical learning methodologies. As the scale and complexity of data continue to grow, the development of efficient and robust optimization techniques has become crucial for solving high-dimensional, structured, and non-smooth learning problems. The session brings together cutting-edge research that bridges the gap between optimization theory and statistical learning practice, highlighting novel algorithmic frameworks and their applications. The presented talks cover a broad spectrum of topics at the forefront of this interdisciplinary field. They explore sparse learning through overlapping group lasso and its solution via augmented Lagrangian methods, and address the critical challenge of hyperparameter selection in sparse models using bilevel optimization and ADMM-based aggregation. Robust classification is examined through a kernel-based one-class SVM with non-convex ℓ_{0/1} soft-margin loss, offering enhanced resilience to outliers. The session also delves into risk minimization techniques that incorporate statistical invariance for improved

regression performance, and presents advanced support matrix machines that leverage sample sparsity, low-rank structure, and adaptive sieving for high-performance computing environments. Together, these contributions exemplify the synergy between optimization and statistical learning, driving progress in both theory and real-world applications.

Session Papers/Abstracts Includes:

1. Title: An augmented Lagrangian method for solving overlapping group lasso problems

All Authors' Names and Affiliations:

1) Qian Li, Department of Applied Mathematics, The Hong Kong Polytechnic University;

2) Defeng Sun, Department of Applied Mathematics, The Hong Kong Polytechnic University;

3) Ning Zhang, School of Computer Science and Technology, Dongguan University of Technology;

4) Yangjing Zhang, Institute of Applied Mathematics, Academy of Mathematics and Systems Science, Chinese Academy of Sciences.

Presenter's Name: Qian Li

2. Title: ADMM-based Bilevel Descent Aggregation Algorithm for Sparse Hyperparameter Selection

All Authors' Names and Affiliations:

1) Yunhai Xiao, Center for Applied Mathematics of Henan Province, Henan University;

2) Anqi Liu, School of Mathematics and Statistics, Henan University;

3) Peili Li, School of Mathematics and Statistics, Henan University;

4) Yanyun Ding, Institute of Applied Mathematics, Shenzhen Polytechnic University.

Presenter's Name: Anqi Liu

3. Title: Robust Kernel-based One-Class Support Vector Machine via $\ell_{0/1}$ Soft-Margin Loss

All Authors' Names and Affiliations:

1) Ming-Zeng Liu, Leicester International Institute, Dalian University of Technology;

2) Yuan-Hai Shao, School of Mathematics and Statistics, Hainan University;

3) Chun-Na Li, School of Mathematics and Statistics, Hainan University;

4) Ya-fen Ye, School of Economics, Zhejiang University of Technology.

Presenter's Name: Ming-Zeng Liu

4. Title: Risk Minimization for Learning Using Statistical Invariant in Regression

All Authors' Names and Affiliations:

1) Tian Liu, School of Information and Communication Engineering, Hainan University;

2) Yuanhai Shao, School of Mathematics and Statistics, Hainan University;

3) Chunna Li, International Business School, Hainan University;

4) Lingwei Huang, School of Mathematics and Statistics, Hainan University.

Presenter's Name: Lingwei Huang

5. Title: Support matrix machine: exploring sample sparsity, low rank, and adaptive sieving in high-performance computing

All Authors' Names and Affiliations:

1) Can Wu, School of Mathematics and Statistics, Hainan University;

2) Dong-Hui Li, School of Mathematical Sciences, South China Normal University;

3) Defeng Sun, Department of Applied Mathematics, The Hong Kong Polytechnic University.

Presenter's Name: Can Wu

6. Title: Efficient Group Lasso Regularized Rank Regression with Data-Driven Parameter Determination

All Authors' Names and Affiliations:

1) Meixia Lin, Engineering Systems and Design, Singapore University of Technology and Design, Singapore;

2) Mengjiao Shi, School of Mathematics and Statistics, Henan University;

3) Yunhai Xiao, School of Mathematics and Statistics, Henan University;

4) Qian Zhang, Engineering Systems and Design, Singapore University of Technology and Design, Singapore.

Presenter's Name: Mengjiao Shi

Special Session 15

Special Session Title: Optimization theory, methods and applications.

Session Organizers' Names and Affiliations: Do Sang Kim (Pukyong National University, Korea), Zai-Yun Peng (Yunnan Normal University, China), Liguo Jiao (Northeast Normal University, China)

Corresponding Organizer's Email: pengzaiyun@126.com

Special Session Introduction: In order to exchange the recent research ideas on structured optimization theory, methods and applications, we organize this special session. In this special session, it includes 9 invited talks from China and Korea.

Session Papers/Abstracts Includes:

1. Title: Ekeland's variational principles with weighted order relations via the null set concept

All Authors' Names and Affiliations: Wenqing Wang (Nanchang University, China) and Yihong Xu (Nanchang University, China)

Presenter's Name: Yihong Xu

2. Title: Dynamic Methods for Solving Optimization Models with Absolute Value Operators

All Authors' Names and Affiliations: Tiange Ma, Liaoning Technical University; Cairong Chen,Fujian Normal University; Deren Han, Beihang University.

Presenter's Name: Donemei Yu

3. Title: A bounded degree hierarchy for SPLD polynomial programs

All Authors' Names and Affiliations: Jae Hyoung Lee (Pukyong National University, Korea)

Presenter's Name: Jae Hyoung Lee

4. Title: Scalarization and well-posedness for set optimization problems involving general set less relations

All Authors' Names and Affiliations: Zai-Yun Peng (Yunnan Normal University, China)

Presenter's Name: Zai-Yun Peng

5. Title: Design of time-delay feedback control for uncertain nonlinear systems with prescribed-time performance

All Authors' Names and Affiliations: Xiangyu Gao (Guangxi Normal University, China)

Presenter's Name: Xiangyu Gao

6. Title: Multi-objective Bayesian optimization theory and safe-MOBO algorithm research under complete critical constraints

All Authors' Names and Affiliations: Yuan Zhang (Chongqing)

Presenter's Name: Yuan Zhang

7. Title: Exact penalization in semi-algebraic optimization with unbounded constraints sets

All Authors' Names and Affiliations: Liguo Jiao (Northeast Normal University, China), Do

Sang Kim (Pukyong National University, Korea), Tien-Son Pham (Dalat University, Vietnam)

Presenter's Name: Liguo Jiao

8. Title: Proximal gradient methods for multiobjective optimization problems

All Authors' Names and Affiliations: Xiaopeng Zhao (Tiangong University, China)

Presenter's Name: Xiaopeng Zhao

9. Title: First-order SDSOS-convex semi-algebraic optimization and exact SOCP relaxations

All Authors' Names and Affiliations: Chengmiao Yang (Northeast Normal University)

Presenter's Name: Chengmiao Yang

10. Title: A New Order Relation for Set Optimization Problems on Complete Lattice Structure

All Authors' Names and Affiliations: Ke-Quan Zhao, Jie Chen (School of Mathematical Sciences, Chongqing Normal University)

Special Session 16

Special Session Title: Modern Optimization Theories, Algorithms and Applications I

Session Organizers' Names and Affiliations: Bo Jiang and Wei Wang, Shanghai University of Finance and Economics

Corresponding Organizer's Email: jiang.bo@mail.shufe.edu.cn

Special Session Introduction: Optimization theory and algorithms are core to solving complex problems across mathematics, finance, engineering, and machine learning. This section showcase cutting-edge research spanning foundational optimization theories, algorithmic advancements, and interdisciplinary applications, uniting scholars to present rigorous theoretical findings, novel algorithm designs, and validated practical applications.

Session Papers/Abstracts Includes:

1. Title: Alternating-Projections-Type Retractions

All Authors' Names and Affiliations: Shixiang Chen, University of Science and Technoloyg of China; Wen Huang, Xiamen University

Presenter's Name: Shixiang Chen

2. Title: Debiasing Conditional Stochastic Optimization

All Authors' Names and Affiliations:

Lie He (Shanghai University of Finance and Economics)

Shiva Kasiviswanathan (Amazon)

Presenter's Name: Lie He

3. Title: Complexity Analysis Framework for Active Manifold Identification and Applications to sparse optimization

All Authors'Names and Affiliations: Min Tao (School of Mathematics, Nanjing University, Nanjing) and Xiao-Ping Zhang (Shenzhen International Graduate School, Tsinghua University)

Presenter's Name: Min Tao

4. Title: Optimal insurance design under distortion risk measures with variance constraint

All Authors' Names and Affiliations:

Wei Wang: Research Institute for Interdisciplinary Sciences, School of Information Management and Engineering, Shanghai University of Finance and Economics, Shanghai 200433, P.R. China. E-mail: wangwei1@sufe.edu.cn.

Tim J. Boonen: Department of Statistics and Actuarial Science, School of Computing and Data Science, The University of Hong Kong, Hong Kong, P.R. China. E-mail: tjboonen@hku.hk.

Wenjun Jiang: Department of Mathematics and Statistics, University of Calgary, Calgary, AB, T2N 1N4, Canada. E-mail: wenjun.jiang@ucalgary.ca.

Yiying Zhang: Department of Mathematics, Southern University of Science and Technology, Shenzhen 518055, P.R. China. E-mail: zhangyy3@sustech.edu.cn.

Presenter's Name: Wei Wang;

Special Session 17

Special Session Title: Modern Optimization Theories, Algorithms and Applications II

Session Organizers' Names and Affiliations: Bo Jiang and Wei Wang, Shanghai University of Finance and Economics

Corresponding Organizer's Email: jiang.bo@mail.shufe.edu.cn

Special Session Introduction: Optimization theory and algorithms are core to solving complex problems across mathematics, finance, engineering, and machine learning. This section showcase cutting-edge research spanning foundational optimization theories, algorithmic advancements, and interdisciplinary applications, uniting scholars to present rigorous

theoretical findings, novel algorithm designs, and validated practical applications.

Session Papers/Abstracts Includes:

1. Title: Robust and Learning-Based Trajectory Planning for Maritime and Port Systems

All Authors' Names and Affiliations: Lei Wang, Yuqi Dou, Xin Li, Keyan Li, Xueling Yi, School of Mathematical Sciences, Dalian University of Technology, Dalian 116024, China

Presenter's Name: Lei Wang,

2. Title: Location optimization of RIS aided broadcast channel

Presenter's Name: Cong SUN

3. Title: Non-convergence Analysis of Randomized Direct Search

All Authors'Names and Affiliations: Cunxin Huang, The Hong Kong Polytechnic University ; Zaikun Zhang, Sun Yat-sen University

Presenter's Name: Zaikun Zhang

4. Title: Acceleration of optimization algorithms via damped charged particle dynamics and its applications

All Authors' Names and Affiliations: Weiping Yan, Yu Tang, Gonglin Yuan, Junyu Lu, Jiajia Yu, Zhongzhou Jin, Guangxi University

Presenter's Name: Gonglin Yuan

Special Session 18

Special Session Title: Recent Advances in Riemannian Optimization

Session Organizers' Names and Affiliations: Chang He, Shanghai University of Finance and Economics

Corresponding Organizer's Email: ischanghe@gmail.com

Special Session Introduction: The field of Riemannian optimization has witnessed a surge of interest due to its unique ability to handle constrained problems by exploiting the underlying geometric structure of the search space. This session brings together recent advances that bridge the gap between abstract Riemannian geometry and practical large-scale computational challenges. The presentations in this session showcase the latest theoretical and algorithmic breakthroughs in the field. We delve into advanced first- and second-order variational analysis that characterizes the geometry of low-rank and determinantal varieties, alongside the

development of innovative Bregman-based and projection-based algorithmic frameworks. Beyond classical settings, this session highlights the expanding reach of Riemannian methods into high-order tensor decompositions and privacy-preserving distributed systems, such as federated learning.

Session Papers/Abstracts Includes:

1. Title: On relatively smooth optimization over Riemannian manifolds

All Authors' Names and Affiliations:

Chang He, School of Information Management and Engineering, Shanghai University of Finance and Economics

Jiaxiang Li, Department of Electrical and Computer Engineering, University of Minnesota

Bo Jiang, School of Information Management and Engineering, Shanghai University of Finance and Economics

Shiqian Ma, Department of Computational Applied Mathematics and Operations Research, Rice University

Shuzhong Zhang, Department of Industrial and System Engineering, University of Minnesota

Presenter's Name: Chang He

2. Title: Normalized tensor train decomposition: Riemannian geometry and applications

All Authors' Names and Affiliations:

Renfeng Peng, Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences

Chengkai Zhu, Thrust of Artificial Intelligence, Information Hub, The Hong Kong University of Science and Technology (Guangzhou)

Bin Gao, Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences

Xin Wang, Thrust of Artificial Intelligence, Information Hub, The Hong Kong University of Science and Technology (Guangzhou)

Ya-xiang Yuan, Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences

Presenter's Name: Renfeng Peng

3. Title: Variational analysis of determinantal varieties

All Authors' Names and Affiliations:

Yan Yang, State Key Laboratory of Mathematical Sciences, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China; University of Chinese

Academy of Sciences, Beijing, China

Bin Gao, State Key Laboratory of Mathematical Sciences, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China

Ya-xiang Yuan, State Key Laboratory of Mathematical Sciences, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China

Presenter's Name: Yan Yang

4. Title: Federated learning on Riemannian manifolds: a gradient-free projection-based approach

All Authors' Names and Affiliations:

Hongye Wang, School of Information Management and Engineering, Shanghai University of Finance and Economics

Zhaoye Pan, School of Information Management and Engineering, Shanghai University of Finance and Economics

Chang He, School of Information Management and Engineering, Shanghai University of Finance and Economics

Jiaxiang Li, Department of Electrical and Computer Engineering, University of Minnesota

Bo Jiang, School of Information Management and Engineering, Shanghai University of Finance and Economics

Presenter's Name: Hongye Wang

Special Session 19

Special Session Title: Learning Based Optimization Techniques and Applications

Session Organizers' Names and Affiliations: Fusheng Bai (Chongqing Normal University), Lizhen Shao (University of Science and Technology Beijing)

Corresponding Organizer's Email: fsbai@cqnu.edu.cn

Special Session Introduction: This special session focuses on machine learning based optimization techniques and their applications. Currently it consists of four talks: the first one is about reinforcement learning based trajectory optimization in autonomous driving, the second one is about efficient computation of the boundary of convex sets via primal-dual neural Approximation, the third one is about fast operational risk assessment method for composite

power systems based on machine learning, and the fourth one is about a new constrained multi-objective programming method based on deep Q-learning assisted parent selection. These talks will allow the participants to feel the strength of the learning based optimization.

Session Papers/Abstracts Includes:

1. Title: A Reinforcement Learning Based Approach to Trajectory Optimization in Autonomous Driving

All Authors' Names and Affiliations: Fusheng Bai, Liuyan Wu (Chongqing Normal University, China), Tao Zhou (Deakin University, Australia)

Presenter's Name: Fusheng Bai

2. Title: Learning Convex Set Boundaries via Primal-Dual Neural Approximation with Application to Reachable Set Computation

All Authors' Names and Affiliations: Guopeng Chen, Lizhen Shao, Fangyuan Zhao; University of Science and Technology Beijing, China

Presenter's Name: Lizhen Shao

3. Title: A Robust and Fast Operational Risk Assessment Method for Composite Power Systems based on Machine Learning

All Authors' Names and Affiliations: Jueyou Li, Tao Xie, Danping Yang; Chongqing Normal University, China

Presenter's Name: Jueyou Li

4. Title: Constrained Multi-objective Programming Based on DQL-assisted Parent Selection

All Authors' Names and Affiliations: Qiang Long, Haoyu Teng; Southwest University of Science and Technology, China

Presenter's Name: Qiang Long

Special Session 20

Special Session Title: Advances in Optimization Algorithms: Theory, Efficiency, and Scalability

Session Organizers' Names and Affiliations: Rujun Jiang, Fudan University

Corresponding Organizer's Email: rjjiang@fudan.edu.cn

Special Session Introduction: This special session brings together cutting-edge research on

the design, analysis, and implementation of optimization algorithms for modern large-scale applications. The session covers diverse yet interconnected topics including first-order methods for economic equilibrium computation, privacy-preserving distributed learning, quasi-Newton methods for nonlinear systems, and accelerated gradient descent through sophisticated stepsize scheduling. Emphasis is placed on both rigorous theoretical foundations—such as convergence rates, complexity bounds, and differential privacy guarantees—and practical computational aspects including GPU acceleration and scalability to high-dimensional problems. These works collectively advance the state-of-the-art in optimization methodology for operations research, machine learning, and economic decision-making.

Session Papers/Abstracts Includes:

1. Title: A Scalable First-Order Method for Large-Scale Competitive Market Equilibrium Computation

All Authors' Names and Affiliations: Huikang Liu (Shanghai Jiao Tong University), Yicheng Huang (Shanghai University of Finance and Economics), Hongpei Li (Shanghai University of Finance and Economics), Dongdong Ge (Shanghai Jiao Tong University), Yinyu Ye (Stanford University)

Presenter's Name: Huikang Liu

2. Title: Differential Privacy in Distributed Learning: Beyond Uniformly Bounded Stochastic Gradients

All Authors' Names and Affiliations: Yue Huang (Sun Yat-sen University), Jiaojiao Zhang (Great Bay University), Qing Ling (Sun Yat-sen University)

Presenter's Name: Jiaojiao Zhang

3. Title: On Local Convergence of Quasi-Newton Methods for Solving Nonlinear Equations

All Authors' Names and Affiliations: Chengchang Liu (CUHK), Luo Luo (Fudan University), John CS Lui (CUHK)

Presenter's Name: Chengchang Liu

4. Title: Accelerated Gradient Descent by Concatenation of Stepsize Schedules

All Authors' Names and Affiliations: Zehao Zhang (Fudan University), Rujun Jiang (Fudan University)

Presenter's Name: Zehao Zhang

Special Session 21

Special Session Title: Advances in Sparse Modeling and Optimization for Data Science

Session Organizers' Names and Affiliations: Guoqiang Wang, School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science Shanghai 201620, China

Corresponding Organizer's Email: guoq_wang@hotmail.com

Special Session Introduction: This special session focuses on recent advances in sparse modeling, non-convex optimization, and robust statistical learning for complex data analysis. The presentations address key challenges across diverse applications—including federated multi-view clustering, robust face recognition, investment tracking, quantile regression, portfolio selection, and tensor autoregressive models. A common thread is the development of novel regularization techniques and efficient optimization algorithms to enforce sparsity, enhance robustness, and improve computational efficiency. The session brings together theoretical innovations and practical applications, offering insights into the latest methodologies for high-dimensional and structured data analysis.

Session Papers/Abstracts Includes:

1. Title: Federated Multi-View Clustering via Sparse Orthogonal Nonnegative Matrix Factorization

All Authors' Names and Affiliations: Yanjiao Zhu (School of Intelligent Systems Engineering, Sun Yat-sen University), Xianchao Xiu (School of Mechatronic Engineering and Automation, Shanghai University), Wanquan Liu (School of Intelligent Systems Engineering, Sun Yat-sen University)

Presenter's Name: Yanjiao Zhu

2. Title: Sparse investment tracking via hybrid lp-l2 regularization

All Authors' Names and Affiliations: Xuerui Gao (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Qian Li (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Changhao Meng (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Guoqiang Wang (School of Mathematics, Physics and Statistics, Shanghai University of

Engineering Science)

Presenter's Name: Xuerui Gao

3. Title: Hybrid second-order gradient histogram based global low-rank sparse regression for robust face recognition

All Authors' Names and Affiliations: Hongxia Li (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Ying Ji (School of Mathematical Sciences, Sunway University), Yongxin Dong (School of Law and Criminal Justice, East China University of Political Science and Law), Yuehua Feng (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science)

Presenter's Name: Hongxia Li

4. Title: A Proximal Gradient Algorithm for High Dimensional Sparse Quantile Regression with Lp Regularization

All Authors' Names and Affiliations: Lintong Liu (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Guoqiang Wang (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science)

Presenter's Name: Lintong Liu

5. Title: Separable Eligible Regularized Mean-Variance Portfolio Selection: A Smoothing Active Set Approach

All Authors' Names and Affiliations: Shuxuan Hao (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Qian Li (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science)

Presenter's Name: Shuxuan Hao

6. Title: Robust multi-view subspace clustering via neighbor embedding and fast l_{2,0}-norm

All Authors' Names and Affiliations: Ying Ji (School of Mathematical Sciences, Sunway University), Kok Lay Teo (School of Mathematical Sciences, Sunway University), Jane Teh Kimm Lii (School of Mathematical Sciences, Sunway University), Guoqiang Wang (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Wanquan Liu (School of Intelligent Systems Engineering, Sun Yat-Sen University), Yanjiao Zhu (School of Intelligent Systems Engineering, Sun Yat-Sen University), Yuehua Feng (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science)

Presenter's Name: Ying Ji

7. Title: A Class of Improved Randomized Gauss-Seidel Methods Based on the Leverage Scores for the Parameters Estimation of TAR Model

All Authors' Names and Affiliations: Zhangyang Xu (Shanghai University of Engineering Science), Juli Zhang (Shanghai University of Engineering Science)

Presenter's Name: Zhang-Yang Xu

8. Title: Portfolio Optimization Model Based on Transfer Entropy and Covariance Penalty

All Authors' Names and Affiliations: Biyu Zhou (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Guoqiang Wang (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science)

Presenter's Name: Biyu Zhou

9. Title: A Comprehensive Overview of Discriminant Analysis: Models, Algorithms, and Applications

All Authors' Names and Affiliations: Nuoya Su (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science), Guoqiang Wang (School of Mathematics, Physics and Statistics, Shanghai University of Engineering Science)

Presenter's Name: Nuoya Su

Special Session 22

Special Session Title: Advanced Optimization and Control Strategies for Complex and Uncertain Environments

Session Organizers' Names and Affiliations: Xin Li, Dalian University of Technology

Corresponding Organizer's Email: lixin31@dlut.edu.cn

Special Session Introduction: As modern systems scale in complexity, researchers face unprecedented challenges regarding high dimensionality, dynamic environments, and structural uncertainties. This special session highlights cutting-edge methodologies that bridge rigorous optimization frameworks with large-scale practical applications. By synthesizing robust control theory, artificial intelligence, and advanced heuristics algorithm, this session provides a comprehensive overview of modern approaches for resolving previously intractable problems in complex dynamical systems.

Session Papers/Abstracts Includes:

1. Title: Existence and Uniqueness of Solutions to Advanced-Coupled Riccati Equations Arising in Stochastic LQ Control with Input Delay

All Authors' Names and Affiliations: Yan Wang (Dalian Jiaotong University), Chenhe Zhang (Dalian Jiaotong University), Lei Wang (Dalian University of Technology)

Presenter's Name: Yan Wang

2. Title: A distributionally robust perimeter control approach for multiregion urban traffic networks with uncertain traffic flow demand

All Authors' Names and Affiliations: Jinlong Yuan (Dalian Maritime University)

Presenter's Name: Jinlong Yuan

3. Title: Neural Network-Based Methods for Solving High-Dimensional Nonlinear Optimization Problems

All Authors' Names and Affiliations: Jiao Teng (Dongguan University of Technology), Ka Fai Cedric Yiu (The Hong Kong Polytechnic University)

Presenter's Name: Jiao Teng

4. Title: Cross-platform mission planning for UAVs under carrier delivery mode

All Authors' Names and Affiliations: Junhong Jin (Dalian University of Technology), Xin Li (Dalian University of Technology), Lei Wang (Dalian University of Technology), Xinwei Wang (Dalian University of Technology)

Presenter's Name: Xin Li

Special Session 23

Special Session Title: Modern Optimization Methods and Their Applications

Session Organizers' Names and Affiliations: Du Shouqiang (Qingdao University), Gao Yan (University of Shanghai for Science and Technology)

Corresponding Organizer's Email: sqdu@qdu.edu.cn; gaoyan@usst.edu.cn

Special Session Introduction: This special session is dedicated to cutting-edge advances in contemporary optimization theories, a core research frontier spanning computational mathematics, operations research, artificial intelligence and engineering practical scenarios. As optimization theory continues to evolve and cross-integrate with multiple disciplines, innovative optimization algorithms and their targeted applications in complex practical

problems have become key driving forces for solving high-dimensional, nonlinear, and constrained computational challenges. Against this background, the present special session brings together a collection of recent contributions, with the aim of presenting advanced developments and promoting further discussions in this important and fast-growing area.

Session Papers/Abstracts Includes:

1. Title: Convex Hull Method for Real-time Pricing in Smart Grid with Multiple Generating Units via Smoothing Optimization

All Authors' Names and Affiliations: Zeyi Zhu (School of Management, University of Shanghai for Science and Technology), Yan Gao (School of Management, University of Shanghai for Science and Technology)

Presenter's Name: Yan Gao

2. Title: Smoothing trust region filter method with dynamic threshold for solving a kind of tensor absolute value equations

All Authors' Names and Affiliations: Huiyin Zhao (School of Mathematics and Statistics, Qingdao University), Shouqiang Du (School of Mathematics and Statistics, Qingdao University), Yuanyuan Chen (School of Mathematics and Statistics, Qingdao University)

Presenter's Name: Shouqiang Du

3. Title: Linearly constrained convex optimization via inertial systems with Hessian driven damping and viscous damping

All Authors' Names and Affiliations: Chuanlong Xu (School of Mathematics and Statistics, Qingdao University), Shouqiang Du (School of Mathematics and Statistics, Qingdao University), Yuanyuan Chen (School of Mathematics and Statistics, Qingdao University), Cheng Xu (School of Mathematics and Statistics, Qingdao University)

Presenter's Name: Chuanlong Xu

4. Title: Multiple objective approach for tensor complementarity problem with GUS-property

All Authors' Names and Affiliations: Chengdan Wang (School of Mathematics and Statistics, Qingdao University), Shouqiang Du (School of Mathematics and Statistics, Qingdao University), Chuanlong Xu (School of Mathematics and Statistics, Qingdao University)

Presenter's Name: Chengdan Wang

5. Title: A New Neural Network for Interval-Valued Optimization Problems

All Authors' Names and Affiliations: Haoning Yang (School of Mathematics and Statistics, Qingdao University), Shouqiang Du (School of Mathematics and Statistics, Qingdao University), Yunxiao Zhang (School of Mathematics and Statistics, Qingdao University), Mengna Zhang (School of Mathematics and Statistics, Qingdao University)

Presenter's Name: Haoning Yang

6. Title: Testing positive definiteness of multivariate forms by tensor eigenvalue complementarity problem

All Authors' Names and Affiliations: Mengna Zhang (School of Mathematics and Statistics, Qingdao University), Shouqiang Du (School of Mathematics and Statistics, Qingdao University), Haoning Yang (School of Mathematics and Statistics, Qingdao University)

Presenter's Name: Mengna Zhang

7. Title: L0-Norm cycleGAN for unpaired CBCT and MR synthesis

All Authors' Names and Affiliations: Yunxiao Zhang (School of Mathematics and Statistics, Qingdao University), Zexian Xu (The Affiliated Hospital of Qingdao University; School of Stomatology, Qingdao University; Dental Digital Medicine & 3D Printing Engineering Laboratory of Qingdao), Renmin Han (Research Center for Mathematics & Interdisciplinary Sciences, Shandong University), Shouqiang Du (School of Mathematics and Statistics, Qingdao University), Yuanyuan Chen (School of Mathematics and Statistics, Qingdao University)

Presenter's Name: Yunxiao Zhang

Special Session 24

Special Session Title: Theory, Algorithms, and Applications over Manifold Optimization

Session Organizers' Names and Affiliations: Chunming Tang (Guangxi University), Wen Huang (Xiamen University)

Corresponding Organizer's Email: cmtang@gxu.edu.cn, wen.huang@xmu.edu.cn

Special Session Introduction: Manifold optimization has been widely used in computer vision, quantum computation, machine learning, and engineering, etc. Compared with traditional optimization, it is more challenging. The main difficulties stem from the complex structure of manifolds, the heavy computation required by geometric tools, and the challenges in designing algorithms and proving their convergence. Recently, rapid advances in nonconvex optimization,

stochastic optimization, and nonsmooth optimization have greatly propelled the development of manifold optimization. These advances have helped expand the application of manifold optimization to many important tasks. In particular, for large-scale machine learning models and low-rank matrix optimization problems, manifold optimization plays an important role in improving computational efficiency and solution quality. This special session aims to discuss recent advances in manifold geometry computations, manifold optimization theory, the design of efficient algorithms, and their applications in various fields.

Session Papers/Abstracts Includes:

1. Title: Improved Penalty Function Approaches for Optimization Problems with General Orthogonality

All Authors' Names and Affiliations: Yongshen Zhang (Guangxi University), Xin Liu (Chinese Academy of Sciences), Nachuan Xiao (The Chinese University of Hong Kong), Chunming Tang (Guangxi University)

Presenter's Name: Yongshen Zhang

2. Title: Augmented Lagrangian methods for nonsmooth problems on Riemannian manifolds

All Authors' Names and Affiliations: Kangkang Deng (National University of Defense Technology)

Presenter's Name: Kangkang Deng

3. Title: Diffeomorphic Logarithm of Special Orthogonal Matrices

All Authors' Names and Affiliations: Zhifeng Deng (School of Mathematical Sciences, Xiamen University), P.-A. Absil (ICTEAM Institute, UCLouvain), Kyle A. Gallivan (Department of Mathematics, Florida State University), Wen Huang (School of Mathematical Sciences, Xiamen University)

Presenter's Name: Wen Huang

4. Title: Quantum circuit design from a retraction-based Riemannian optimization framework

All Authors' Names and Affiliations: Zhijian Lai (Beijing International Center for Mathematical Research, Peking University), Hantao Nie (Beijing International Center for Mathematical Research, Peking University), Jiayuan Wu (Wharton Department of Statistics and Data Science, University of Pennsylvania), Dong An (Beijing International Center for

Mathematical Research, Peking University)

Presenter's Name: Zhijian Lai

5. Title: Manifold Optimization Algorithms in Independent Component Analysis

All Authors' Names and Affiliations: Jianze Li (Sun Yat-sen University)

Presenter's Name: Jianze Li

6. Title: Optimization for Grassmann dictionary learning with Stiefel representatives

All Authors' Names and Affiliations: Xiaojing Zhu (Shanghai University of Electric Power), Liuxu Du (Shanghai University of Electric Power)

Presenter's Name: Xiaojing Zhu

7. Title: An Inexact Proximal Framework for Nonsmooth Riemannian Difference-of-Convex Optimization

All Authors' Names and Affiliations: Bo Jiang (Ministry of Education Key Laboratory of NSLSCS, School of Mathematical Sciences, Nanjing Normal University), Meng Xu (State Key Laboratory of Scientific and Engineering Computing, Institute of Computational Mathematics and Scientific/Engineering Computing, Academy of Mathematics and Systems Science, Chinese Academy of Sciences), Xingju Cai (Ministry of Education Key Laboratory of NSLSCS, School of Mathematical Sciences, Nanjing Normal University), Ya-Feng Liu (Ministry of Education Key Laboratory of Mathematics and Information Networks, School of Mathematical Sciences, Beijing University of Posts and Telecommunications)

Presenter's Name: Bo Jiang

Special Session 25

Special Session Title: Integer Programming: Theory, Algorithms, and Applications

Session Organizers' Names and Affiliations: Wei-Kun Chen (Beijing Institute of Technology), Akang Wang (Shenzhen Research Institute of Big Data)

Corresponding Organizer's Email: chenweikun@bit.edu.cn, wangakang@sribd.cn

Session Papers/Abstracts Includes:

1. Title: Fast Presolving Framework For Sparsity Constrained Convex Quadratic Programming: Screening-Based Cut Generation and Selection

All Authors' Names and Affiliations: Haozhe Tan (Department of Industrial Systems Engineering and Management, National University of Singapore), Guanyi Wang (Department

of Industrial Systems Engineering and Management, National University of Singapore)

Presenter's Name: Guanyi Wang

2. Title: Solving Chance Constrained Programs via a Penalty based Difference of Convex Approach

All Authors' Names and Affiliations: Zhiping Li (IEDA, HKUST), Nan Jiang (IEDA, HKUST), Rujun Jiang (School of Data Science, Fudan University)

Presenter's Name: Zhiping Li

3. Title: Smoothing Binary Optimization: A Primal-Dual Perspective

All Authors' Names and Affiliations: Wenbo Liu (University of Chinese Academy of Sciences; Shenzhen Research Institute of Big Data; The Chinese University of Hong Kong, Shenzhen), Akang Wang (University of Chinese Academy of Sciences; Shenzhen Research Institute of Big Data; The Chinese University of Hong Kong, Shenzhen), Dun Ma (University of Chinese Academy of Sciences; Shenzhen Research Institute of Big Data; The Chinese University of Hong Kong, Shenzhen), Hongyi Jiang (City University of Hong Kong), Jianghua Wu (University of Chinese Academy of Sciences; Shenzhen Research Institute of Big Data; The Chinese University of Hong Kong, Shenzhen), Wenguo Yang (University of Chinese Academy of Sciences)

Presenter's Name: Akang Wang

4. Title: On the convexification of mixed-integer convex quadratic sets

All Authors' Names and Affiliations: Guxing Du (Chinese University of Hong Kong, Shenzhen), Rui Chen (Chinese University of Hong Kong, Shenzhen), Linchuan Wei (Chinese University of Hong Kong, Shenzhen)

Presenter's Name: Linchuan Wei

5. Title: Column Generation for Bayesian Network Structure Learning via Difference-of-Submodular Optimization

All Authors' Names and Affiliations: Yiran Yang (School of Data Science, The Chinese University of Hong Kong, Shenzhen), Rui Chen (School of Data Science, The Chinese University of Hong Kong, Shenzhen)

Presenter's Name: Yiran Yang

6. Title: Polyhedral results for two classes of submodular sets with GUB constraints

All Authors' Names and Affiliations: Weikang Qian (School of Mathematical Sciences, University of Science and Technology of China), Keyan Li (School of Mathematics and Statistics, Beijing Institute of Technology), Wei-Kun Chen (School of Mathematics and Statistics, Beijing Institute of Technology), Yu-Hong Dai (School of Mathematical Sciences, University of Chinese Academy of Sciences)

Presenter's Name: Wei-Kun Chen

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