Taiwan-Vietnam Optimization Workshop

Department of Mathematics
National Taiwan Normal University

August 4, 2025

Sponsored by

College of Science, National Taiwan Normal University
Department of Mathematics, National Taiwan Normal University
Center for Optimal Intelligent Data Analytics and Prediction

Organized by

Jein-Shan Chen

Table 1: Schedule on August 4, 2025. Place: M212, Mathematics Department Building

	Speaker	Title	Chair
13:30 | 14:00	Pham Ngoc Anh	Outer Approximation Projection Methods with Applications to Image Recovery Models	Jein-Shan Chen
14:00 | 14:30	Ching-Yu Yang	Improved approach for obtaining dual cones and extended construction of convex cones	Jein-Shan Chen
14:30 | 15:00	Hoang Thi Cam Thach	Inertial projection algorithms for solving multivalued variational inequality problems in Hilbert spaces	Jein-Shan Chen
15:00 | 15:30	*Tea Break*		
15:30 | 16:00	Po-Yi Lu	Guidance Generation for Test-time Preference Alignment of Diffusion Models	Yu-Lin Chang
16:00 | 16:30	Nguyen Duc Hien	Strong convergence of inertial hybrid subgradient methods for solving equilibrium problems in Hilbert spaces	Yu-Lin Chang
16:30 | 17:00	Mai Tan Ha	Learning from Complementary-Label Learning	Yu-Lin Chang
17:00 | 17:30	*Free Discussion*		

Set Outer Approximation Projection Methods with Applications to Image Recovery Models

Pham Ngoc Anh
Department of Scientific Fundamentals
Posts and Telecommunications Institute of Technology, Hanoi, Vietnam

Abstract. In this talk, we present a new outer proximation projection approach for solving the variational inequality problems in the real Euclidean space, where the feasible set is replaced by its polyhedral outer approximation. First, we prove the quasicontractiveness of the outer proximal operator. Second, we apply this property to present two new algorithms and their convergence under strongly monotone and Lipschitz continuous conditions of the cost mapping. Finally, we give some numerical results for the proposed algorithms and comparison with other well - known methods via image recovery models.

Improved approach for obtaining dual cones and extended construction of convex cones

Ching-Yu Yang
Department of Mathematics
National Taiwan Normal University, Taiwan.

Abstract. In our previous work [1], we introduced two novel ways for generating closed convex cones. The first method constructs closed convex cones via inequalities, while the second employs support functions. Furthermore, We derived the corresponding dual and polar cones through their associated support functions. In this presentation, we discuss an enhanced approach for obtaining dual and polar cones from convex cones, as well as an extended framework for the construction of convex cones.

References

[1] C-Y Yang, Y-L Chang, C-C Hu, and J-S Chen, *Novel constructions for closed convex cones through inequalities and support functions*, Journal of Optimization Theory and Applications, vol. 205, no. 3, Article 57, 2025.

Inertial projection algorithms for solving multivalued variational inequality problems in Hilbert spaces

Hoang Thi Cam Thach
Department of Applied Science
University of Transport Technology, Hanoi, Vietnam.

Abstract. This talk considers the multivalued variational inequality problems, $MVI(C, F)$, where C is a nonempty closed convex subset of a real Hilbert space H and $F : C \to 2^H$ is a multivalued mapping with nonempty values set. By combining the nonexpansiveness of metric projection and inertial techniques, we propose an algorithm under monotone and Lipschitz continuous assumption of the cost mapping F . The convergence of the iteration sequences generated by the algorithm is demonstrated under certain assumptions of the cost mapping and suitable chosen parameters. Finally, we give some numerical results for the proposed algorithm and comparison with some other well-known algorithms.

Key words: Multivalued variational inequality problems, Inertial technique, Lipschitz continuous, metric projection.

Guidance Generation for Test-time Preference Alignment of Diffusion Models

Po-Yi Lu
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Abstract. Diffusion Models (DMs) are famous generative AI models widely used to generate realistic images, videos, audio, and biological data. While these models already produce high-quality outputs, aligning their results with specific user preferences remains challenging. To better align model outputs with user preferences, methods like reinforcement learning from human feedback (RLHF) and direct preference optimization (DPO) have been developed for large language models (LLMs). However, these techniques involve heavy computational demands during training, making them difficult to use in environments with limited computing resources. This talk will first explain how diffusion models work from score matching and guidance perspectives. Next, we will demonstrate how the score matching and guidance relate to preference alignment. Finally, we will introduce an idea: applying a specific guidance signal during inference to achieve faster generation of high-quality outputs aligned with user preferences.

Strong convergence of inertial hybrid subgradient methods for solving equilibrium problems in Hilbert spaces

Nguyen Duc Hien
Department of Cooperation and Start-up
Duy Tan University, Danang, Vietnam.

Abstract. In this paper, we introduce new iteration algorithms for solving equilibrium problems where the constrained sets are given as the intersection of the fixed point sets of demicontractive mappings in a real Hilbert space. The proposed algorithms are based on the subgradient method for variational inequalities and the inertial techniques for finding fixed points of nonexpansive mappings. Strong convergence of the iterative process is proved. Numerical experiments are provided to show computational efficiency of the proposed algorithms and comparison with some other known algorithms.

Learning from Complementary-Label Learning

Mai Tan Ha
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National Taiwan University, Taiwan.

Abstract. Complementary-label learning (CLL) is a weakly supervised paradigm for multiclass classification in which each instance is annotated only with the classes it does not belong to, reducing annotation effort while introducing indirect supervision and label noise. Although unbiased risk estimators and specialized loss functions have established CLL's theoretical underpinnings, its real-world applicability remains limited by a lack of comprehensive empirical validation and effective noise-handling techniques. We begin by diagnosing the gaps between CLL's theoretical promise and practical use, pinpointing the barriers that prevent real-world deployment. Next, we demonstrate CLL's acute sensitivity to noisy supervision and present general strategies for mitigating complementary-label noise, supported by benchmarking results from our open-source toolkit with standardized implementations and evaluation protocols. Finally, we outline promising research directions to boost scalability, strengthen robustness under severe noise, and pave the way for practical CLL applications.