

EDITORIAL
SPECIAL ISSUE ON FAST ALGORITHMS AND THEORIES FOR APPLICATIONS
IN SIGNAL AND IMAGE PROCESSING

This special issue focuses on the interdisciplinary area of optimization algorithms and their applications in signal and image processing. Optimization algorithms, especially operator-splitting algorithms (e.g. ADMM and proximal gradient methods) and stochastic gradient methods, have gained tremendous popularity in solving large-scale models arising from imaging and machine learning applications.

This issue features original research articles that aim to advance the theories and applications of optimization algorithms. Theoretical analysis of convergence rate, computational complexity, and stability of splitting algorithms are combined with practical implementations in real-world signal and image processing tasks. Numerical experiments are presented to demonstrate the performance of new optimization models and algorithms.

The papers collected here aim to push the frontier of our mathematical understanding of optimization algorithms and open new opportunities for algorithm development in imaging and machine learning. Researchers from different backgrounds, including applied mathematics, computer science, and electrical engineering, present their latest research progress and share innovative ideas.

The goal of this special issue is to promote stronger interactions among researchers in optimization theory and signal/image processing, and catalyze more interdisciplinary research to address complex data processing challenges faced by science and engineering. We hope the high-quality research showcased here will inspire new perspectives and lead to wider applications of optimization algorithms in the years to come.

We wish to thank all the authors for their contributions and the reviewers for their thoughtful comments and suggestions. We also thank the editors of the journal for making this special issue possible. By bringing together these important works, we aim to push the boundary of this exciting multidisciplinary field and inspire more collaborations among researchers from different backgrounds.

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