Sparse Optimization and First Order Methods: Recent Researches

Ryota Iwamoto

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In 2024, Teboule, Cohen, Luke, Pinta, and Sabach proposed a new method: a Semi-Bregman Proximal Alternating Method (SBPALM) for a class of nonconvex problems [1]. This algorithm is a revised method of Proximal Alternating Linearized Minimization (PALM) method, which is a first order method for nonconvex-nonsmooth optimization problems [2]. In 2018,

References

- [1] M. Teboule, E. Cohen, D. R. Luke, T. Pinta, and S. Sabach. A Semi-Bregman Proximal Alternating Method for a Class of Nonconvex Problems: Local and Global Convergence Analysis. Jonunal of Global Optimization, Springer, 89 (2024), 33–55.
- [2] J. Bolte, S. Sabach, and M. Teboulle. Proximal alternating linearized minimization for nonconvex and nonsmooth problems. Math. Program., 146(1-2):459–494, 2014.
- [3] J. Bolte, S. Sabach, M. Teboulle, and Y. Vasibourd. First Order Methods Beyond Convexity and Lipschitz Gradient Continuity with Applications to Quadratic Inverse Problems. SIAM J. Optim., 28(3);2131–2151, 2018

[4]

- [5] J.M. Borwein and A.S. Lewis. Convex Analysis and Nonlinear Optimization: Theory and Examples, Springer-Verlag, New York, 2000.
- [6] A.S. Lewis. Convex Analysis on the Hermitian matrices. SIAM J. Optimization, 6 (1996), 164–177.
- [7] R.T. Rockafellar. Convex Analysis. Princeton University Press, Princeton, New Jersey, 1970.
- [8] R.T. Rockafellar and R.J.B Wets. Variational Analysis. Springer-Verlag, New York, 1998.
- [9] A. Seeger. Convex analysis of spectrally defined matrix functions. SIAM J. Optimization, 7 (1997), 679–696.
- [10] F. Flores-Bazán, R. López and C. Vera. Vector Asymptotic Functions and Their Ap-

- plication to Multiobjective Optimization Problems. SIAM J. Optimization, 34 (2024), 1826–1851.
- [11] T. Tanaka. Cone-Quasiconvexity of Vector-Valued Functions. Science Reports of the Hirosaki University, 42 (1995), 157–163.
- [12] T. Tanaka. Approximately Efficient Solutions in Vector Optimization. J. Multi-Criteria Decision Analysis, 5 (1996), 271–278.
- [13] R.I. Boţ, S.-M. Grad and G. Wanka. Duality in Vector Optimization, Springer-Verlag, Berlin-Heidelberg (2009)