Optimization Theory and Algorithm II **October 14, 2022**

Homework 4

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HW 1 *Derive BCD algorithm for LASSO problem.*

HW 2 *Derive ADMM algorithm for Fused LASSO problem.*

HW 3 *Consider the following Basis Pursuit problem as:*

$$\begin{aligned} &\min_{\mathbf{x}} \ \|\mathbf{x}\|_1 \\ &s.t. \ A\mathbf{x} = \mathbf{b}. \end{aligned}$$

Derive ADMM algorithm for it.

Hit: using the indicator function of $\Omega = \{\mathbf{x}|A\mathbf{x} = \mathbf{b}\}$.

HW 4 *Look at readme file. Solving LASSO problem by*

(1) Proximal Gradient Descent.

(2) BCD.

(3) ADMM.

References