TITLE

AUTHORS

Abstract. Abstract

Key words. key words

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1. Introduction.

1.1. Contributions.

1.2. Previous studies / State-of-the-art.

1.3. Organization of the paper.

1.4. Notation.

2. .

3. .

$$\begin{aligned} &\min_{\beta,\tau} \quad \frac{1}{2}\sum_{n=1}^{N}\left(F_n(\boldsymbol{\beta})\boldsymbol{\tau} - \tilde{w}_n\right)^2 + \frac{1}{2}\lambda_\alpha \left\|\boldsymbol{\tau}\right\|_2^2 + \lambda_\beta \mathcal{R}(\boldsymbol{\beta}) \\ &\text{s.t.} \quad \boldsymbol{\tau} \in \mathbb{R}_+^M,\ \boldsymbol{\beta} \in]0,1[^M \end{aligned} \tag{3.1}$$

where $\mathcal{R}$ is a regularization that is proper, convex and lower-semicontinuous (e.g. the total variation $\mathcal{R}(\mathbf{x}) = \|\mathbf{D}\mathbf{x}\|_1$ with $\mathbf{D}$ the discrete gradient matrix defined as the idendity matrix with coefficients -1 on its subdiagonal).

Equation (3.1) has the typical form of a variable projection problem [1]. Indeed, it can be formulated as

$$\begin{aligned} &\min_{\beta,\tau} \quad \frac{1}{2}\left\|\begin{pmatrix} F(\boldsymbol{\beta}) \\ \sqrt{\lambda_\alpha}\,\mathrm{Id}\end{pmatrix}\boldsymbol{\tau} - \begin{pmatrix}\tilde{w} \\ \mathbf{0}\end{pmatrix}\right\|_2^2 + \lambda_\beta \mathcal{R}(\beta) \\ &\text{s.t.} \quad \boldsymbol{\tau} \in \mathbb{R}_+^M,\ \boldsymbol{\beta} \in]0,1[^M \end{aligned} \tag{3.2}$$

4. .

5. Conclusion.
Conclusion

Appendix A. Proof of blablabla.

REFERENCES

[1] D. P. O'Leary and B. W. Rust, *Variable projection for nonlinear least squares problems*, Comput. Optim. Appl., 54 (2012), pp. 579–593, https://doi.org/10.1007/s10589-012-9492-9.