CORRECTION

STRONG ORACLE OPTIMALITY OF FOLDED CONCAVE PENALIZED ESTIMATION

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In this note we include a correction to equation (19) on page 840, which is a step in the proof of Theorem 4 of Fan, Xue and Zou [*Ann. Statist.* **42** (2014) 819–849]. There is no change in the statement of Theorem 4, and the rest of the proof stays unchanged. Equation (19) on page 840 should be corrected in the following way:

We apply the coordinatewise mean-value theorem with respect to each coordinate of $\boldsymbol{\beta}$ (i.e., β_j) to obtain that

$$\nabla_j \ell_n(\widehat{\boldsymbol{\beta}}^{\text{oracle}}) = \nabla_j \ell_n(\boldsymbol{\beta}^\star) + [\nabla^2 \ell_n(\boldsymbol{\beta}^\star)]_j \cdot \widehat{\boldsymbol{\Delta}} + R_j(\widetilde{\boldsymbol{\Delta}}^{(j)}),$$

where $[\nabla^2 \ell_n(\boldsymbol{\beta}^\star)]_j$ denotes the jth row of $\nabla^2 \ell_n(\boldsymbol{\beta}^\star)$, $\widetilde{\boldsymbol{\beta}}^{(j)}$ is on the line segment joining $\widehat{\boldsymbol{\beta}}^{\text{oracle}}$ and $\boldsymbol{\beta}^\star$ and $R_j(\widetilde{\boldsymbol{\Delta}}^{(j)}) = [\nabla^2 \ell_n(\widetilde{\boldsymbol{\beta}}^{(j)}) - \nabla^2 \ell_n(\boldsymbol{\beta}^\star)]_j \cdot \widehat{\boldsymbol{\Delta}}$.

Define

$$\mathbf{R}(\widetilde{\boldsymbol{\Delta}}) = \left(R_1(\widetilde{\boldsymbol{\Delta}}^{(1)}), R_2(\widetilde{\boldsymbol{\Delta}}^{(2)}), \ldots, R_p(\widetilde{\boldsymbol{\Delta}}^{(p)}) \right)',$$

and rewrite $\mathbf{R}(\widetilde{\boldsymbol{\Delta}})$ as $(\mathbf{R}'_{\mathcal{A}}(\widetilde{\boldsymbol{\Delta}}), \mathbf{R}'_{\mathcal{A}^c}(\widetilde{\boldsymbol{\Delta}}))'$.

The rest of the proof stays the same.

REFERENCES

FAN, J., XUE, L. and ZOU, H. (2014). Strong oracle optimality of folded concave penalized estimation. *Ann. Statist.* **42** 819–849. MR3210988

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