



## Corrigendum

## Corrigendum to “Robust smoothing of gridded data in one and higher dimensions with missing values” [Comput. Statist. Data Anal. 54 (2010) 1167–1178]

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On page 1170, Eq. (14) converges, for any initial conditions, if the matrix  $A$  is positive definite.

In the original paper, it was asserted that  $D$  is nonsingular. This is obviously wrong since one eigenvalue is zero (see Eq. (8)). Thus the positive definiteness of  $A$  still remains to be proved.

We assume that the non negative weights  $w_i$  are not identically zero. By definition,  $A = sD^T D + W$  and  $s > 0$ . Since, for any  $X$ , we have  $X^T(D^T D)X = \|DX\|^2 \geq 0$  and  $X^T W X = \sum_{i=1}^n w_i x_i^2 \geq 0$ , one has  $X^T A X \geq 0$ . Since  $A$  is symmetric,  $A$  is positive semidefinite.

Now, let  $X$  be a vector such that  $X^T A X = 0$ ; then (1)  $DX = 0$  and (2)  $X^T W X = 0$ .

(1) From Eq. (8), the  $n \times n$  matrix  $D$  has  $n$  distinct eigenvalues, one of them being zero. Therefore, the kernel of  $D$  is of dimension 1. Since it is clear that any constant vector belongs to this kernel, the latter consists of the set of the constant vectors. Therefore, since  $DX = 0$ , we deduce that  $X$  is constant.

(2) We write  $X^T W X = \sum_{i=1}^n w_i x_i^2 = (\sum_{i=1}^n w_i) x_1^2 = 0$  (because  $X$  is constant). But  $(\sum_{i=1}^n w_i) > 0$ , by hypothesis. Therefore,  $x_1 = 0$ , and hence,  $X = 0$ .

As a consequence  $X^T A X = 0$  implies  $X = 0$ . The matrix  $A$  is thus positive definite.

According to Theorem 3 of Keller (1965), the convergence of (14) is ensured.

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