Corrigendum

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

Louis Le Tarnec, Damien Garcia∗

CRCHUM - Research Centre, University of Montreal Hospital, Canada

A R T I C L E  I N F O

Article history:
Available online 13 December 2011

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 wi are not identically zero. By definition, \( A = sD^TD + W \) and \( s > 0 \). Since, for any \( X \), we have \( X^T(D^TD)X = \|DX\|^2 \geq 0 \) and \( X^TWX = \sum_{i=1}^{n} w_i x_i^2 \geq 0 \), one has \( X^TAX \geq 0 \). Since A is symmetric, A is positive semidefinite.

Now, let X be a vector such that \( X^TAX = 0 \); then (1) \( DX = 0 \) and (2) \( X^TWX = 0 \).

(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 \( X^TWX = \sum_{i=1}^{n} w_i x_i^2 = \left( \sum_{i=1}^{n} w_i \right) x_1^2 = 0 \) (because X is constant). But \( \left( \sum_{i=1}^{n} w_i \right) > 0 \), by hypothesis. Therefore, \( x_1 = 0 \), and hence, \( X = 0 \).

As a consequence \( X^TAX = 0 \) implies \( X = 0 \). The matrix A is thus positive definite.

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

DOI of original article: 10.1016/j.csda.2009.09.020.

* Correspondence to: CRCHUM, Pavilion J.A. de Séve, 2099 Alexandre de Séve, Montreal, QC, H2L2W5, Canada. Tel.: +1 514 890 8000 × 24705.
E-mail address: Damien.Garcia@crchum.qc.ca (D. Garcia).