

## Erratum:

# Erratum to: Fast global kernel fuzzy c-means clustering algorithm for consonant/vowel segmentation of speech signal

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The original version of this article unfortunately contained mistakes. Algorithm 6 should be as follows:

### Algorithm 6 FGKFCM-F clustering

#### Input:

- (1)  $X = \{\mathbf{x}_1, \mathbf{x}_2, \dots, \mathbf{x}_N\}$ ,  $\mathbf{x}_i \in \mathbb{R}^d$ ,  $i=1, 2, \dots, N$ , the dataset;
- (2)  $C$ ,  $1 < C \leq N$ , the number of clusters;
- (3)  $\varepsilon > 0$ , the stopping criterion;
- (4)  $\boldsymbol{\mu}^{(0)} = (\boldsymbol{\mu}_1^{(0)}, \boldsymbol{\mu}_2^{(0)}, \dots, \boldsymbol{\mu}_C^{(0)})$ , the initials of memberships;
- (5)  $m > 1$ , the weighting exponent;
- (6)  $\sigma$ , the GRBF kernel parameter.

#### Output:

- (1)  $\tilde{\mathbf{v}} = (\tilde{\mathbf{v}}_1, \tilde{\mathbf{v}}_2, \dots, \tilde{\mathbf{v}}_C)$ , the final cluster prototypes;
- (2)  $\boldsymbol{\mu} = (\boldsymbol{\mu}_1, \boldsymbol{\mu}_2, \dots, \boldsymbol{\mu}_C)$ , the final memberships.

- 1 Compute  $\tilde{\mathbf{v}}^*(1)$  using Eq. (23) with initial position  $\tilde{\mathbf{v}}(1)$  placed at the data point that minimizes Eq. (24);
- 2 **for**  $k=2$  to  $C$  **do**
- 3   **for**  $n=1$  to  $N$  **do**

- 4     Set the initial state  

$$\tilde{\mathbf{v}}^{n(0)}(k) = (\tilde{\mathbf{v}}_1(k), \tilde{\mathbf{v}}_2(k), \dots, \tilde{\mathbf{v}}_{k-1}(k), \tilde{\mathbf{v}}_k(k))$$

$$= (\tilde{\mathbf{v}}_1^*(k-1), \tilde{\mathbf{v}}_2^*(k-1), \dots, \tilde{\mathbf{v}}_{k-1}^*(k-1), \mathbf{x}_n);$$
- 5     Set initial memberships  $\boldsymbol{\mu}^{n(0)}(k)$  with respect to  
 $\tilde{\mathbf{v}}^{n(0)}(k)$  using Eq. (25);
- 6     **end**
- 7      $l = \arg \min_{1 \leq n \leq N} J^\phi(\boldsymbol{\mu}^n(k))$  using Eq. (19);
- 8      $\boldsymbol{\mu}^n(k) \leftarrow \text{KFCM-F}\left(X, k, \varepsilon, m, \sigma^2, \boldsymbol{\mu}^{n(0)}(k)\right);$
- 9      $\tilde{\mathbf{v}}^{n(0)}(k) \leftarrow \tilde{\mathbf{v}}^l(k);$
- 10     $s=1;$
- 11    Update  $\tilde{\mathbf{v}}^{(s)}(k)$  with  $\tilde{\mathbf{v}}^{(s-1)}(k)$  using Eq. (23);
- 12    If  $\|\tilde{\mathbf{v}}^{(s)}(k) - \tilde{\mathbf{v}}^{(s-1)}(k)\| < \varepsilon$
- 13      STOP and  $\tilde{\mathbf{v}}^*(k) \leftarrow \tilde{\mathbf{v}}^{(s)}(k);$
- 14      Else  $s=s+1$  and return to line 11;
- 15     **end**
- 16     $\tilde{\mathbf{v}} \leftarrow \tilde{\mathbf{v}}^*(C)$ ,  $\boldsymbol{\mu} \leftarrow \boldsymbol{\mu}^*(C).$