A Review on Temporal Reasoning using Support Vector Machines ERRATA

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***Abstract*—This document presents an errata of: Madeo, R. C. B. ; Lima, C. A. M. ; Peres, S. M.. A Review on Temporal Reasoning using Support Vector Machines. In: 19th International Symposium on Temporal Representation and Reasoning, 2012, Leicester (UK). Proceedings of 19th International Symposium on Temporal Representation and Reasoning, 2012. p. 114-121. Digital Object Identifier: 10.1109/TIME.2012.15. Each section in this document corresponds to a section in the original paper, and presents the errata for the corresponding section.**

I. Support Vector Machines

In Section 2 – Support Vector Machines – there is an error about Cover Theorem. While the paper states:

> "This approach is based on Cover Theorem, which states that an feature space with non-linearly separable data can be mapped with high probability into an input space where the data is linearly separable, provided that the mapping is non-linear and the feature space dimension is high enough [2]",

the right statement would be:

> "This approach is based on Cover Theorem, which states that an input space with non-linearly separable data can be mapped with high probability into a feature space where the data is linearly separable, provided that the mapping is non-linear and the feature space dimension is high enough [2]".

II. Least-Squares Support Vector Machines

In Section 3 – Least-Squares Support Vector Machines – there is an error in the equation that presents LS-SVM formulation. The Equation that is given by

$$\text{“min } \mathcal{J}_2(\boldsymbol{w}, b, e) = \frac{1}{2}\langle \boldsymbol{w} \cdot \boldsymbol{w} \rangle + \frac{C}{2}\sum_{k=1}^{N} \xi_i^2\text{”},$$

should be given by

$$\text{“min } \mathcal{J}_2(\boldsymbol{w}, b, \boldsymbol{\xi}) = \frac{1}{2}\langle \boldsymbol{w} \cdot \boldsymbol{w} \rangle + \frac{C}{2}\sum_{k=1}^{N} \xi_i^2\text{”}.$$

Also, the equality constrainsts for LS-SVM stated as

$$\text{“}y_k[\langle \boldsymbol{w} \cdot \varphi(\boldsymbol{x_i}) \rangle + b] = 1 - \xi_i, \quad i = 1, \cdots, N\text{”},$$

should be given by

$$\text{“}y_i[\langle \boldsymbol{w} \cdot \varphi(\boldsymbol{x_i}) \rangle + b] = 1 - \xi_i, \quad i = 1, \cdots, N\text{”},$$

with y_i instead of y_k. The same indexing error occurs in

> "Recurrent LS-SVM (RLS-SVM) is mostly applied to time series forecasting [7]. The idea is to consider as data a series of input data u_k and a series of output data y_k and an autonomous recurrent model such as
>
> $$\hat{y}_k = f(\hat{y}_{i-1}, \hat{y}_{i-2}, ..., \hat{y}_{i-p})\text{”},$$

which must be

> "Recurrent LS-SVM (RLS-SVM) is mostly applied to time series forecasting [7]. The idea is to consider as data a series of input data u_i and a series of output data y_i and an autonomous recurrent model such as
>
> $$\hat{y}_i = f(\hat{y}_{i-1}, \hat{y}_{i-2}, ..., \hat{y}_{i-p})\text{”},$$

and in the footnote, which states

> "In our notation, $[y_{k-1}, y_{k-2}, \cdots, y_{k-p}]$ is, therefore, equivalent to $\boldsymbol{x_i}$ in the SVM model input."

and should be

> "In our notation, $[y_{i-1}, y_{i-2}, \cdots, y_{i-p}]$ is, therefore, equivalent to $\boldsymbol{x_i}$ in the SVM model input."