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Paired passive aggressive for ranking and classification

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Abstract

This paper describes the ....
Keywords: Passive aggressive, AUC, MAP

1. Introduction

Here is some introduction...

2. The second section

Varient 1 - sequantial balanced passive aggressive
Varient 2 - using the different cases
Varient 3 - solving the exact using DCA
Varient 4 - multiclass

Remainder omitted in this sample. See http://www.jmlr.org/papers/ for full paper.

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Appendix A.

In this appendix we prove the following theorem from Section X.X:

Theorem *First we will show that the 1 - AUC is bounded by the mean of the errors in the first class and the mean number of errors in the second class.* $1 - AUC \leq E(M^{+}) + E(M^{-})$
■

Proof

$$1 - AUC = \frac{1}{|X^{-}||X^{+}|} \sum_{x^{+} \in X^{+}, x^{-} \in X^{-}} \mathbb{1}_{w^{T}x^{+} \leq w^{T}x^{-}} \quad \leq$$
$$\frac{1}{|X^{-}||X^{+}|} \sum_{x^{+} \in X^{+}, x^{-} \in X^{-}} \mathbb{1}_{w^{T}x^{+} \leq 0} \; + \; \mathbb{1}_{0 \leq w^{T}x^{-}} \quad =$$
$$\frac{1}{|X^{+}|} \sum_{x^{+} \in X^{+}} \mathbb{1}_{w^{T}x^{+} \leq 0} \; + \; \frac{1}{|X^{-}|} \sum_{x^{-} \in X^{-}} \mathbb{1}_{0 \leq w^{T}x^{-}} \; = \; E(M^{+}) + E(M^{-}) \quad (1)$$

and that is that.

Theorem *The sum of the average mistake in the two classes can be bounded* $E(M^{+}) + E(M^{-}) \leq \frac{1}{|X^{-}||X^{+}|} \, max\{R^{2}, 1/C\}(||\mathbf{u}||^{2} + 2C \sum_{t=1}^{T} l_{t}^{*+} + l_{t}^{*-})$ ■

Proof.

$$. \quad (2)$$

References