SVM-Boosting based on Markov resampling: Theory and algorithm

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Abstract:-

Vector support Machine (SVM) has been widely used for segregation activities. The difficulty of SVM training depends on the number of training samples and therefore increases with large data sets. This paper focuses on this approach in [1], where SVM classification was improved based on the Markov sample. We use Markov's sample duplication techniques for Growth methods based on Markov's resampling in Support Vector Machine (SVM), using Boosting algorithms: SVM-Boosting based on Markov's sample (SVM-BM). Numerical database-based show that the proposed two resampling-based SVM Boosting algorithms for linear base classifiers have small misclassification rates.

ALGORITHM:-

To study the learning performance of Boosting algorithm based on Markov resampling, we apply it to SVM with linear kernel function and introduce two new Boosting algorithms: SVM-Boosting based on Markov Resampling (SVM-BM) and Im-proved SVM-Boosting based on Markov Resampling (ISVM-BM).

1. Input: D_train, n2, q, N, T
2. Output: sign(fT) = sign(ΣTt=1 αt gt)
3. Draw randomly samples D0 = {zi}Ni=1 from D_train, train D0 by algorithm (8) and obtain a classification function g0, draw randomly a sample z from D_train,
4. z1 ← z, let t ← 1
5. **while t ≤ T d**
    a. i ← 1, n1 ← 0
6. **while i ≤ N do**
7. **Draw randomly a sample z∗ from D_train,**
8. pi+1t ← min{1, e−ℓ(gt−1,z∗)/e−ℓ(gt−1,zi)}
9. if n1 > n2 then
10. pi+1t ← min{1, qpi+1t }, zi ← z∗, Dt ← zi, i ← i + 1, n1 ← 0
11. end
12. if pi+1
13. **t ≡ 1 and y∗yi = 1 then**
14. pi+1t ← e−y∗gt−1 /e−yigt−1
15. end
16. if rand(1) < pi+1t then
17. zi ← z∗, Dt ← zi, i ← i + 1, n1 ← 0
18. end
19. **if z∗ is not accepted then**
20. n1 ← n1 + 1
21. end
22. end
23. Obtain Markov chain Dt = {zi}N
24. i=1, train Dt by algorithm (8) and obtain another classification function gt .
25. et ← P(Y/= sign(gt (X))|D_train)

26. $\alpha t \leftarrow (1/2) * \log((1 - et)/et)$
27. $z1 \leftarrow z*$, $t \leftarrow t + 1$
28. if $\alpha t < 0$ then
29. $t \leftarrow t - 1$
30. end

RESULT:-