Foundations of Machine Learning (CS 725)

FALL 2024

Lecture 20:

- SVMs and Kernels

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Question

Recall the soft-margin SVM where each $(\mathbf{x}_i, y_i)$ is associated with a ξ_i and the objective contains a term $C \sum_i \xi_i$. Say we impose an additional constraint that $\forall i, \xi_i = \xi_1$. What can we say about the minimum value of the objective function under the modified constraints, say α, in comparison to the minimum under the original constraints, say β?

A $\alpha = \beta$

B $\alpha \leq \beta$

C $\alpha \geq \beta$

β is the minimum value under fewer constraints; guaranteed to be at least as good (if not better) than α obtained with additional constraints.

Gaussian Kernel