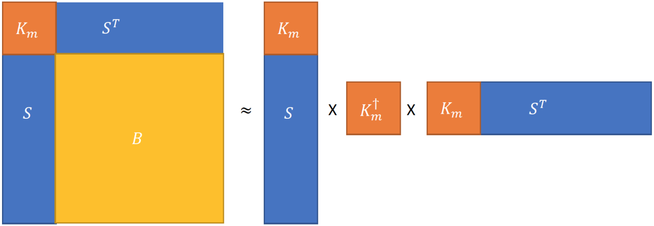
Nyström based Kernel SVM

- Solving the dual form of kernel SVM:

$$\max_{\alpha \in \mathbb{R}^n} -\frac{1}{n}\sum_{i=1}^{n} \ell_i^*(\alpha_i) - \frac{1}{2\lambda n^2}\alpha^T K \alpha$$

- Using Nyström method to approximate large kernel matrix K as:



- The two-step approach:
  - Adding ℓ_1 term to learn a good dual solution

$$\max_{\alpha\in\mathbb{R}^n} -\frac{1}{n}\sum_{i=1}^{n}\ell_i^*(\alpha_i) - \frac{1}{2\lambda n^2}\alpha^T\hat{K}\alpha - \frac{\tau}{n}||\alpha||_1$$

  - Constructing a new set of landmark points based on good dual solution for Nyström approximation and retraining SVM
- Establishing a theoretical guarantee on the learned dual solution.
- Experimental results show that the proposed two-step approach improves the performance.

Welcome to check the detail about our paper!