

PRML chapter6

1. Dual Representations

- how dual expressions express least-square problems in terms of the kernel function $k(x, x')$.

2. Constructing kernels

- There are two ways to construct the kernel function, one is constructing from a feature space mapping, and the other is constructing from imagination and check whether a function constitutes a valid kernel.
- polynomial kernel and gaussian kernel are often used
- combine probabilistic generative model and discriminative model
 - fisher kernel

3. Radial Basis Function Networks

- Q: what form basis functions should be taken?
- A: RBF is often used
- Nadaraya-Watson model
- motivation is to consider interpolation problem, when input variables are noisy

4. Gaussian Process

- Linear regression revisited
 - Definition of gaussian process
- Gaussian processes for regression
 - add the noise to the model and find the conditional distribution $p(t_{N+1} | \mathbf{t})$,
- Learning the hyperparameters
- Automatic relevance determination
 - the precision parameters η_i enables us to choose the input variables which is useless.
- Gaussian processes for classification
- Laplace approximation
 - in order to calculate the Gaussian processes for classification.