- $f_i(x)$为 r 次多项式函数，x 为 n 维模式，则有

$$f_i(x) = x_{p_1}^{s_1} x_{p_2}^{s_2} \cdots x_{p_r}^{s_r}, \quad p_1, p_2, \dots, p_r = 1,2,\dots,n, \quad s_1, s_2, \dots, s_r = 0,1$$

此时，判别函数 d(x)可用以下递推关系给出：

常数项：$d^{(0)}(x) = w_{n+1}$

一次项：$d^{(1)}(x) = \sum_{p_1=1}^{n} w_{p_1} x_{p_1} + d^{(0)}(x)$

二次项：$d^{(2)}(x) = \sum_{p_1=1}^{n} \sum_{p_2=p_1}^{n} w_{p_1 p_2} x_{p_1} x_{p_2} + d^{(1)}(x)$

r 次项：

$$d^{(r)}(x) = \sum_{p_1=1}^{n} \sum_{p_2=p_1}^{n} \cdots \sum_{p_r=p_{r-1}}^{n} w_{p_1 p_2 \cdots p_r} x_{p_1} x_{p_2} \cdots x_{p_r} + d^{(r-1)}(x)$$

d(x)总项数的讨论：对于 n 维 x 向量，若用 r 次多项式，d(x)的权系数的总项数为：$N_w = C_{n+r}^{r} = \frac{(n+r)!}{r!n!}$

当 r=2 时：$N_w = C_{n+2}^{2} = \frac{(n+2)!}{2!n!} = \frac{(n+2)(n+1)}{2}$

当 r=3 时：$N_w = C_{n+3}^{3} = \frac{(n+3)!}{3!n!} = \frac{(n+3)(n+2)(n+1)}{6}$