- $f_i(\boldsymbol{x})$为 r 次多项式函数，$\boldsymbol{x}$ 为 n 维模式，则有

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

此时，判别函数 $d(\boldsymbol{x})$可用以下递推关系给出：

常数项：$d^{(0)}(\boldsymbol{x}) = w_{n+1}$

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

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

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

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

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

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