Constraints in the Null Space

- Two quadratic Conditions

$$p_1p_6 + p_2p_5 - p_3p_4 = 0,$$

$$2p_1p_7 - p_2p_4 - p_3p_5 = 0.$$

- In the null space

$$h_1(\alpha_i; i = 1\ldots 8-n) = \sum_{i=1,j=1}^{i=8-n,j=8-n} k_{1ij}\alpha_i\alpha_j = 0,$$

$$h_2(\alpha_i; i = 1\ldots 8-n) = \sum_{i=1,j=1}^{i=8-n,j=8-n} k_{2ij}\alpha_i\alpha_j = 0$$

Optimal Model

Minimize $f(\alpha_i) = \sum_{i=1}^{i=u} {f_{1_i}}^2 \omega_{1i} + \sum_{j=1}^{j=v} {f_{2_j}}^2 \omega_{2j}$

$$\text{subject to} \quad h_1 = 0,\ h_2 = 0, \ldots, h_{(m+2)} = 0$$
$$g \leq 0$$

where

h_1 and h_2 are the two quadratic constraints on G-manifolds,

while *g* is an inequality constraint.

- Objective function represents algebraic fitting error of relaxed geometric constraints.