# A more complete solution

1. Find $H$ up to a scale factor from the point coorrespondences

2. Compute $H' = K^{-1}H$. Let $H'$'s columns be $\begin{pmatrix} a & b & c \end{pmatrix}$

3. Minimize

$$\| \begin{pmatrix} a & b & c \end{pmatrix} - \lambda \begin{pmatrix} r_1 & r_2 & T \end{pmatrix} \|_F$$

w.r.t. $\lambda \in \mathbb{R}, r_1, r_2, T \in \mathbb{R}^3$
s.t. $r_1^T r_2 = 0$ and $\|r_1\| = \|r_2\| = 1$

Let

$$\begin{pmatrix} a & b & c \end{pmatrix} = U_{3x2} \begin{pmatrix} s_1 & 0 \\ 0 & s_2 \end{pmatrix} V_{2x2}^T.$$

Then

$$\begin{pmatrix} r_1 & r_2 \end{pmatrix} = U_{3x2} V_{2x2}^T \qquad \text{and} \qquad \lambda = \frac{s_1 + s_2}{2}$$

4. $T = c/\lambda$ and $R = \begin{pmatrix} r_1 & r_2 & r_1 \times r_2 \end{pmatrix}$. Make $R$ to have determinant.