



$$\begin{array}{lcl}
 A1 & = & G * P1 \\
 A2 & = & G * P2
 \end{array}
 \quad
 \begin{array}{cc}
 P1 & \\
 P2 & M
 \end{array}$$

Consistent Loss      Hierarchical Loss



$$\begin{aligned}
 & \min_{G, P_1, P_2} \|A_1 - GP_1\|_F^2 + \alpha \|A_2 - GP_2\|_F^2 - \gamma \text{tr}(P_1 M P_2^T) + \lambda_1 \|G\|_F^2 + \lambda_2 (\|P_1\|_F^2 + \|P_2\|_F^2) \\
 & s.t. \quad G \geq 0, P_1, P_2 \geq 0
 \end{aligned}$$