

$$\begin{array}{c}
\text{ROI}_1(a=1) \\
\vdots \\
\text{ROI}_2(a=2) \\
\vdots \\
\text{ROI}_p(a=p)
\end{array}
\left\{
\begin{array}{c}
\begin{array}{ccccc}
I_1 & I_2 & I_3 & \cdots & I_m \\
\hat{A}_{12}^{(1)} & \hat{A}_{12}^{(2)} & \hat{A}_{12}^{(3)} & \cdots & \hat{A}_{12}^{(m)} \\
\hat{A}_{13}^{(1)} & \hat{A}_{13}^{(2)} & \hat{A}_{13}^{(3)} & \cdots & \hat{A}_{13}^{(m)} \\
\vdots & \vdots & \vdots & \cdots & \vdots \\
\hat{A}_{1p}^{(1)} & \hat{A}_{1p}^{(2)} & \hat{A}_{1p}^{(3)} & \cdots & \hat{A}_{1p}^{(m)}
\end{array} \\
\hline
\begin{array}{ccccc}
\hat{A}_{21}^{(1)} & \hat{A}_{21}^{(2)} & \hat{A}_{21}^{(3)} & \cdots & \hat{A}_{21}^{(m)} \\
\hat{A}_{23}^{(1)} & \hat{A}_{23}^{(2)} & \hat{A}_{23}^{(3)} & \cdots & \hat{A}_{23}^{(m)} \\
\vdots & \vdots & \vdots & \cdots & \vdots \\
\hat{A}_{2p}^{(1)} & \hat{A}_{2p}^{(2)} & \hat{A}_{2p}^{(3)} & \cdots & \hat{A}_{2p}^{(m)}
\end{array} \\
\hline
\begin{array}{ccccc}
\vdots & \vdots & \vdots & \cdots & \vdots \\
\hat{A}_{p1}^{(1)} & \hat{A}_{p1}^{(2)} & \hat{A}_{p1}^{(3)} & \cdots & \hat{A}_{p1}^{(m)} \\
\hat{A}_{p2}^{(1)} & \hat{A}_{p2}^{(2)} & \hat{A}_{p2}^{(3)} & \cdots & \hat{A}_{p2}^{(m)} \\
\vdots & \vdots & \vdots & \cdots & \vdots \\
\hat{A}_{p,p-1}^{(1)} & \hat{A}_{p,p-1}^{(2)} & \hat{A}_{p,p-1}^{(3)} & \cdots & \hat{A}_{p,p-1}^{(m)}
\end{array}
\end{array}
\right\} = X$$