

$$\begin{aligned}
\mathbf{x}^\star &= \arg \min_{\mathbf{x}} \mathcal{D}(\mathbf{x}; \{\mathbf{y}_k\}_{k=1}^K) + \mathcal{P}(\mathbf{x}) \\
&= \arg \min_{\mathbf{x}} \sum_{k=1}^K \|\mathbf{y}_k - \mathcal{A}_k(\mathbf{x})\|_2^2 + \mathcal{P}(\mathbf{x})
\end{aligned}$$