

Primal feasibility: $\forall i \in \mathcal{I}, \quad \arg \max_c \Phi_c(x_i; \theta^*) = y_i$

Dual feasibility: $\forall i \in \mathcal{I}, \quad \lambda_i \geq 0,$

Stationarity: $\theta^* = - \sum_{i=1}^n \lambda_i \nabla_{\theta} \mathcal{L}(\Phi(x_i; \theta^*), y_i),$

Manifold: $\forall i \in \mathcal{I}, \quad x_i \in \mathcal{M}.$