

Intuition about Bayes Risk

- All \mathcal{P}_θ are the same \Rightarrow Can't say anything about θ from x

- Need to capture how different \mathcal{P}_θ are

• On new way to capture:

- If \mathcal{P}_θ are “close” to some Q on average, then $I(\mathcal{P}, w)$ is “small”

$$I(\mathcal{P}, w) = \inf_Q E_{\theta \sim w} [d_{\text{KL}}(\mathcal{P}_\theta \parallel Q)]$$

Intuition about Bayes Risk

- All \mathcal{P}_θ are the same \implies Can't say anything about θ from x
 - Need to capture how different \mathcal{P}_θ are
- One way to capture:

$$I(\mathcal{P}, w) = \inf_Q E_{\theta \sim w}[d_{\text{KL}}(\mathcal{P}_\theta \parallel Q)]$$

- If \mathcal{P}_θ are “close” to some Q on average, then $I(\mathcal{P}, w)$ is “small”

Bayes Risk Lower Bounds