

$$\begin{aligned}
& \mathbb{E}_{\mathbf{x}, \mathbf{y} \sim D} \left[\left(\frac{d\ell(f(\mathbf{x}, \theta), \mathbf{y})}{d\theta} - \frac{dL(\theta)}{d\theta} \right)^2 \right] \\
&= \mathbb{E}_{\mathbf{x}, \mathbf{y} \sim D} \left[\left(\frac{d\ell(f(\mathbf{x}, \theta), \mathbf{y})}{d\theta} \right)^2 \right] - \left(\frac{dL(\theta)}{d\theta} \right)^2
\end{aligned}$$