

Estimate \hat{f} \equiv Learn \hat{f}

sources of error:

irreducible error ϵ

reducible error \hat{f}

the squared error for a given estimate \hat{f} is

$$E(\text{actual} - \text{predicted})^2 = E(Y - \hat{Y})^2$$

which factors as

$$\underbrace{E[f(X) - \hat{f}(X)]^2}_{\text{reducible}} + \underbrace{\text{Var}(\epsilon)}_{\text{irreducible}}$$

$$Y = f(X) + \epsilon$$

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