Bias - Variance Tradeoff

$$\text{Error}(x) = \left(E\left[\hat{f}(x)\right] - f(x)\right)^2 + E\left[\hat{f}(x) - E\left[\hat{f}(x)\right]\right]^2 + \sigma_e^2$$

- $E\left[\hat{f}(x)\right]$: predicted
- $f(x)$: true
- $\hat{f}(x)$: predicted
- $E\left[\hat{f}(x)\right]$: average predicted value
- σ_e^2: irreducible error

Bias²

How much predicted values differ from true values.

Variance

How predictions made on the same value vary on different realizations of the model

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