Sample title

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Overview

Bias-Variance Trade-Off

Bias Error

- Also called 'Overfitting'

Variance

Bias-Variance Trade-Off

Bias Error

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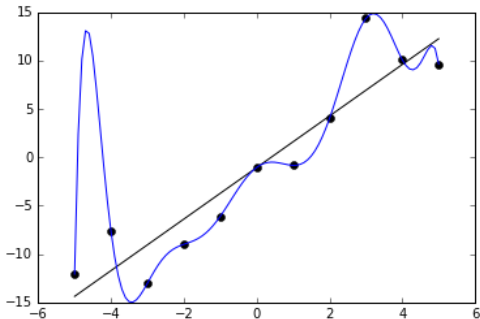
Variance

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Bias-Variance Trade-Off

Bias Error
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Variance
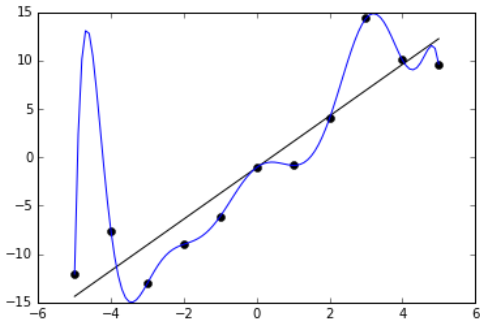- Also called 'Underfitting'

Bias-Variance Trade-Off

Bias Error

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- Predicts test data too well

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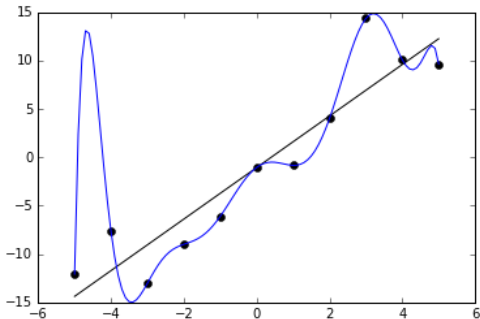- Also called 'Underfitting'

Bias-Variance Trade-Off

Bias Error

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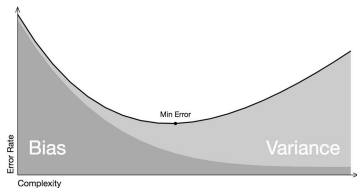- Predicts test data too well

Variance

- Also called 'Underfitting'
- Generalizes too well

Bias-Variance Trade-Off

- Aiming for the lowest total error typically means finding a "middle-ground"
- A common technique for this is determining the minimum *mean squared error.*

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

$$= \text{Bias}^2 + \text{Variance} + \text{Irreducible Error}$$

Hastie Lectures

- Statistical Learning and Regression
- Dimensionality and Parametric Models
- Assessing Model Accuracy and Bias-Variance Trade-Off
- Classification Problems and K-Nearest Neighbors

Statistical Learning and Regression

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- Or the range may be adjusted such that it includes the k-nearest neighbors.

Dimensionality and Parametric Models

Assessing Model Accuracy and Bias-Variance Trade-Off

Classification Problems and K-Nearest Neighbors