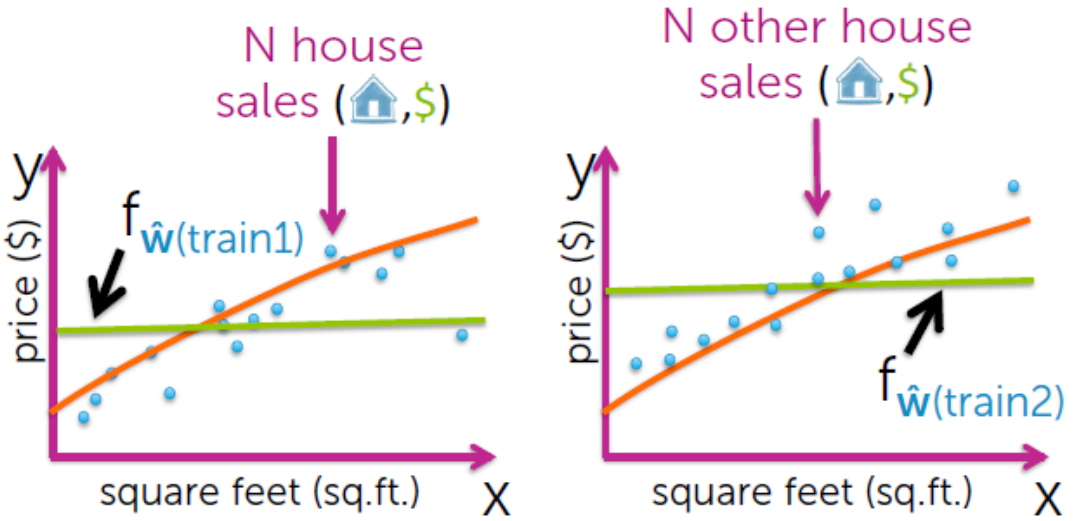
Bias and Variance

Part II

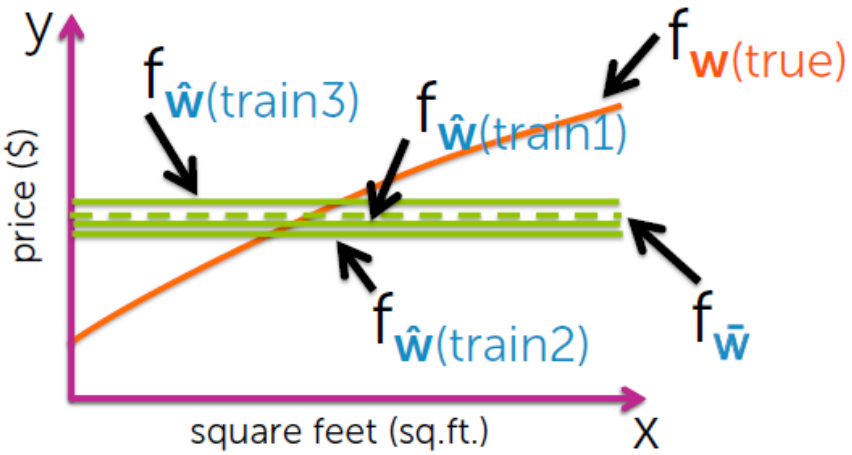
Bias Contribution: Part I

Assume we fit a constant function



Bias Contribution: Part II

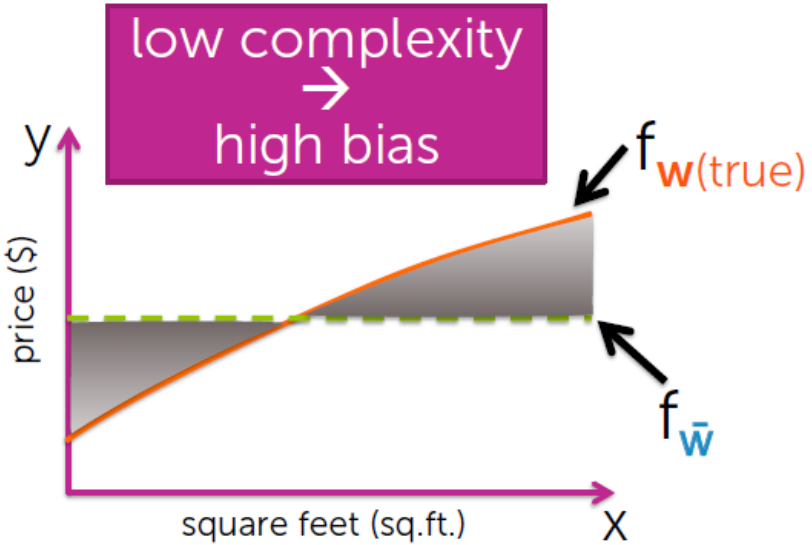
Overall possible size N training sets, what do I expect my fit to be?



Bias Contribution: Part III

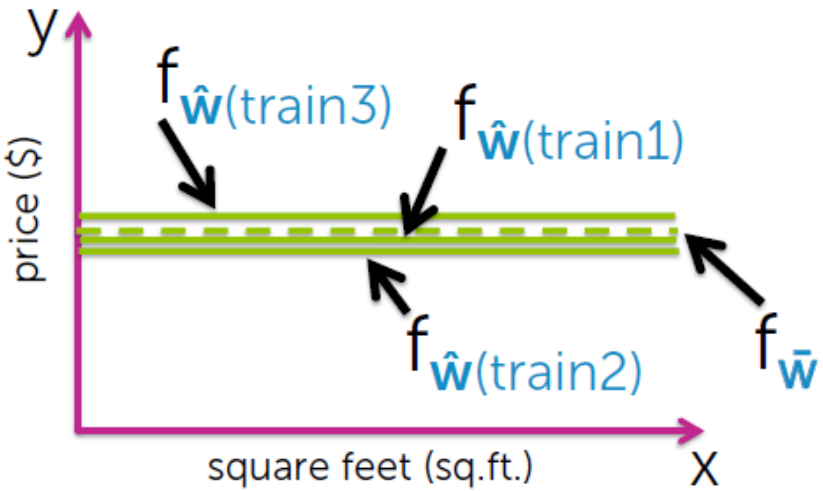
$$\text{Bias}(\mathbf{x}) = f_{\mathbf{w}(\text{true})}(\mathbf{x}) - f_{\bar{\mathbf{w}}}(\mathbf{x})$$

Is our approach flexible enough to capture $f_{\mathbf{w}(\text{true})}$? If not, error in predictions.



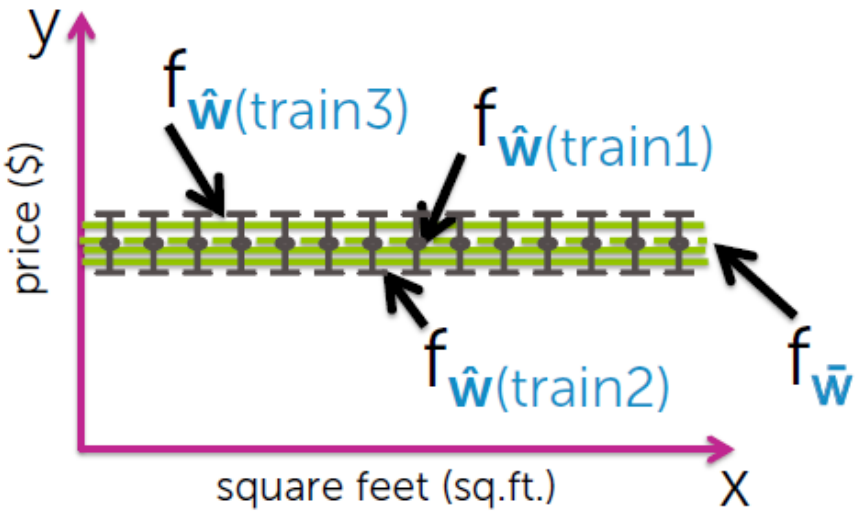
Variance Contribution: Part I

How much do specific fits vary from the expected fit?



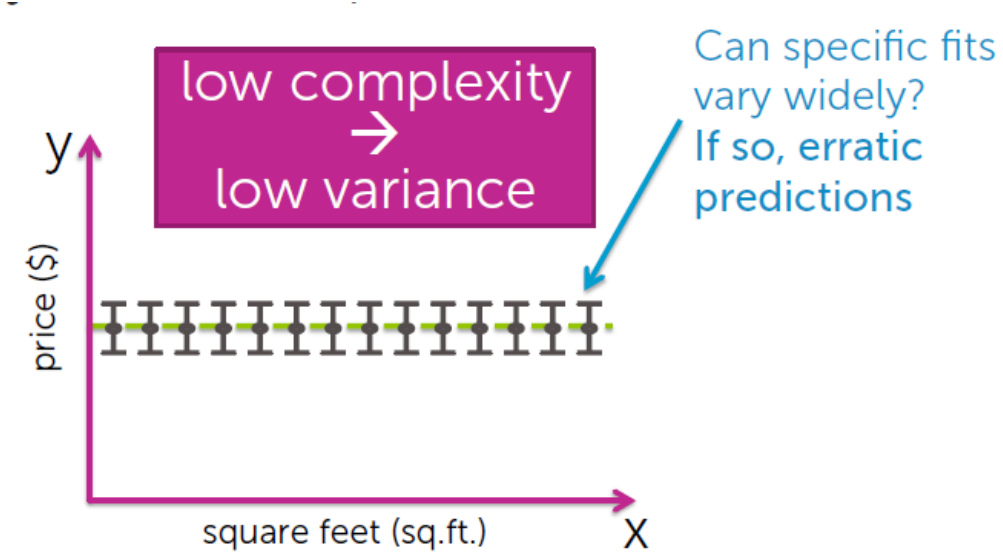
Variance Contribution: Part II

How much do specific fits vary from the expected fit?



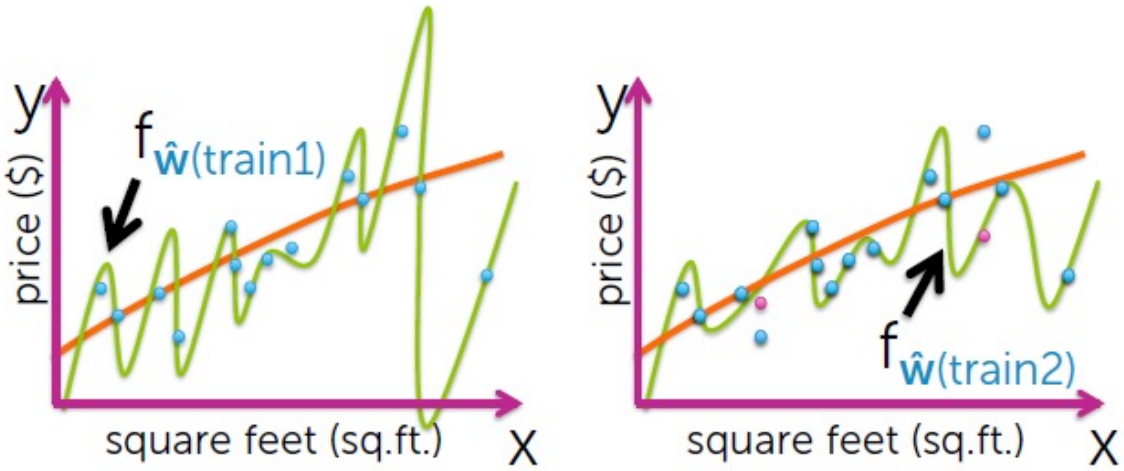
Variance Contribution: Part III

How much do specific fits vary from the expected fit?



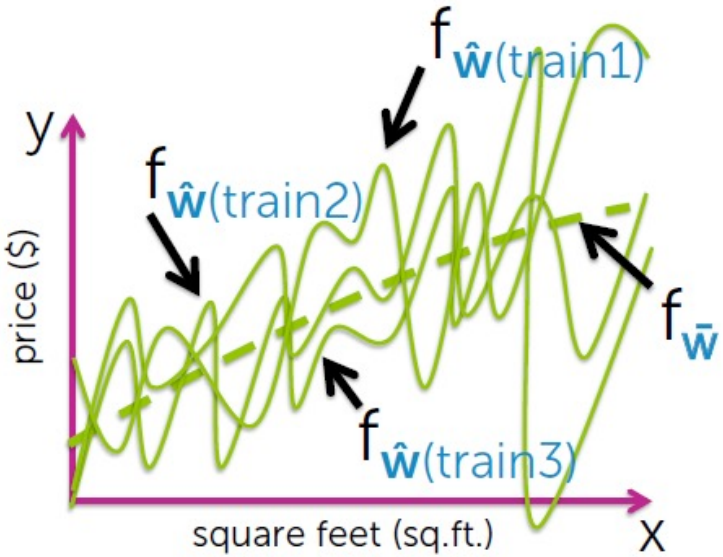
Variance of High-Complexity Models: Part I

Assume we fit a high-order polynomial



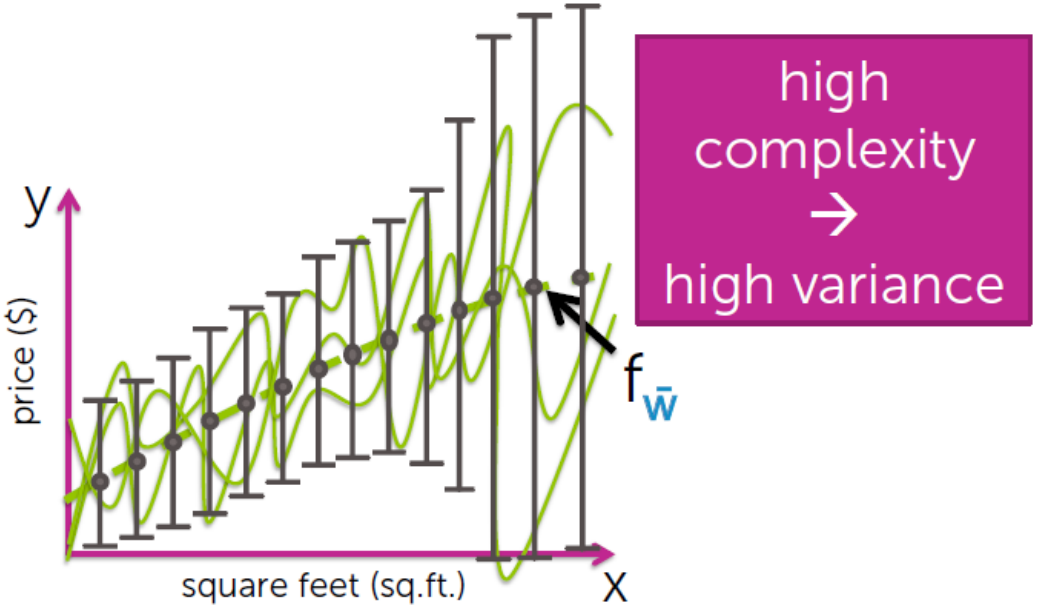
Variance of High-Complexity Models: Part II

Assume we fit a high-order polynomial

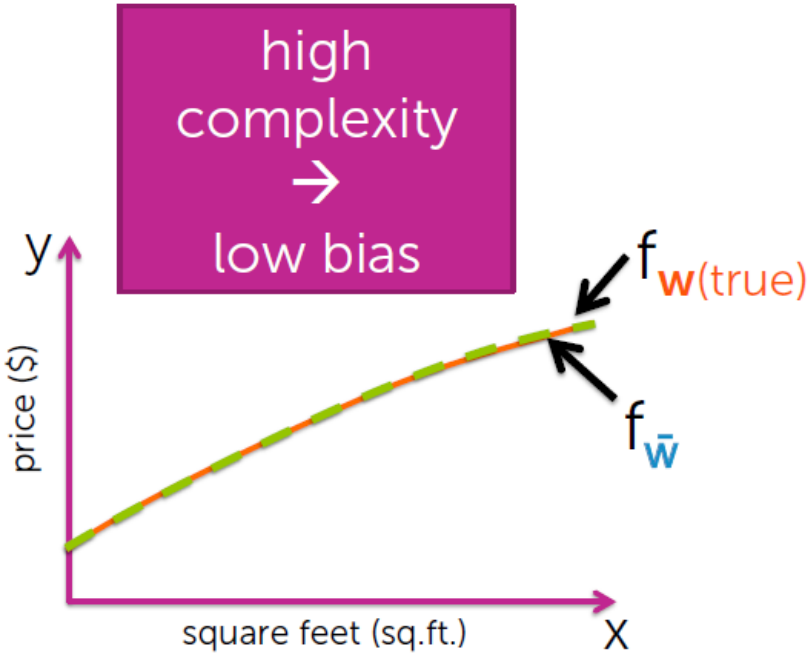


Variance of High-Complexity Models: Part III

Assume we fit a high-order polynomial



Bias of High-Complexity Models



Bias-Variance Tradeoff