# Week 6

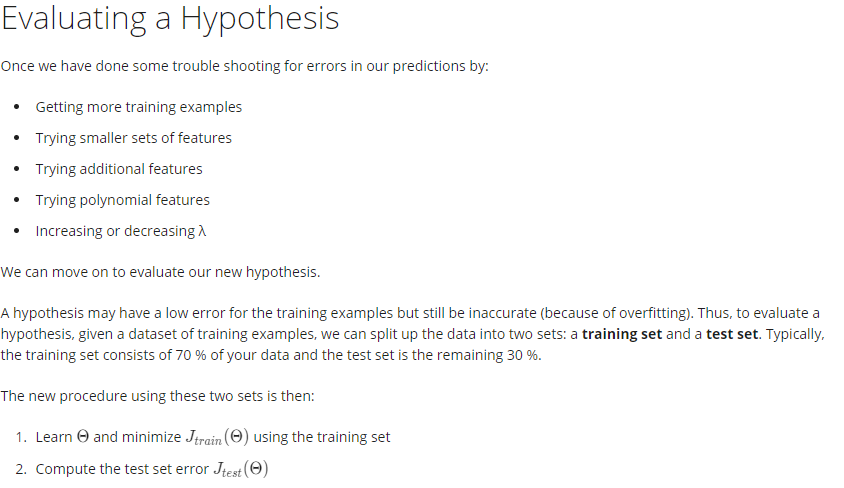
## Evaluating a Learning Algorithm

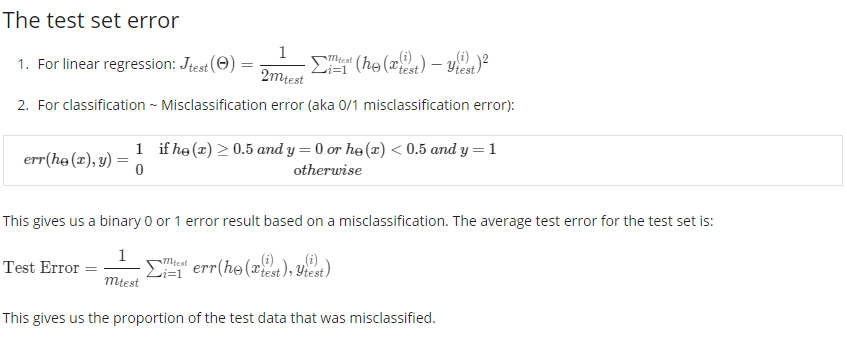
Deciding What to Try Next

* Developing or improving machine learning systems
* What to try next
* obtaining more training examples
* smaller sets of features
* getting additional features
* additional polynomial features
* decreasing λ
* increasing λ
* Diagnostics:
* What is/isn’t working
* Guidance as to how to improve performance
* Can rule out courses of action unlikely to significantly improve performance
* Take time to implement and understand

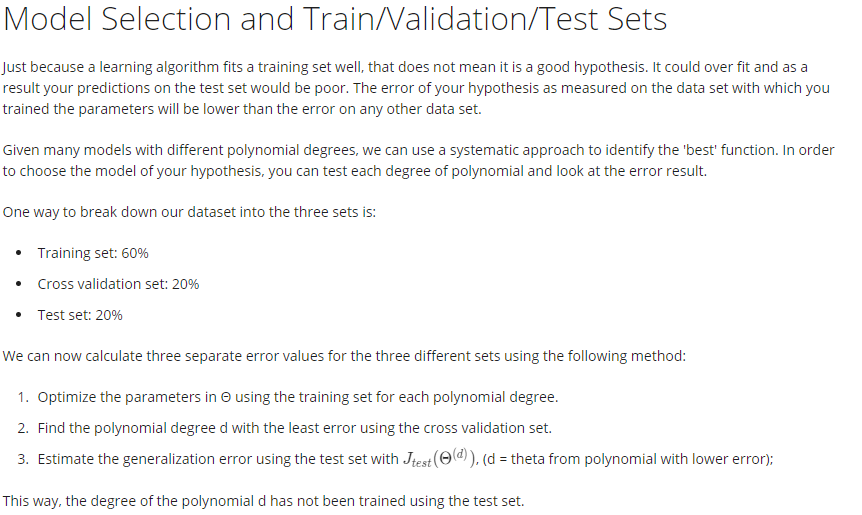
Evaluating a Hypothesis

* Failing to generalize to new examples not in training set (overfitting)
* Splitting 70/30%
* Randomize or reorder/shuffle
* Linear regression
* θ, training J, test J



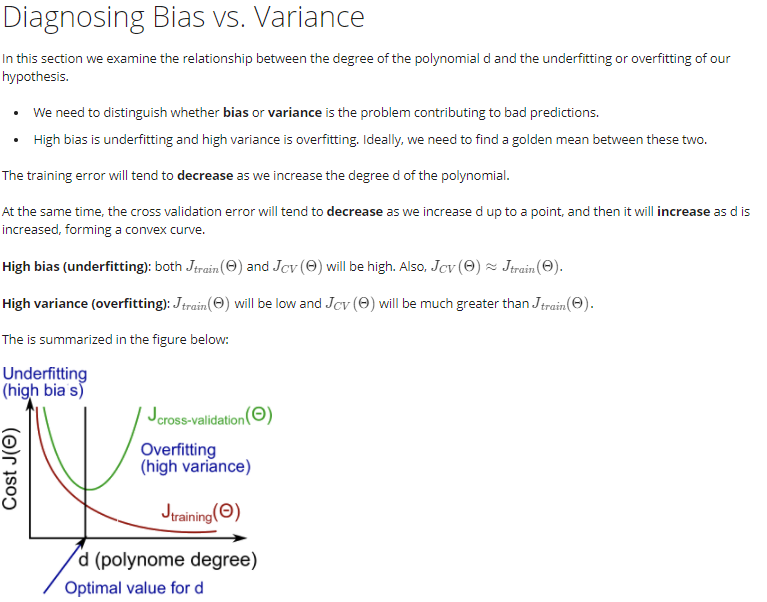


Model Selection and Train/Validation/Test Sets



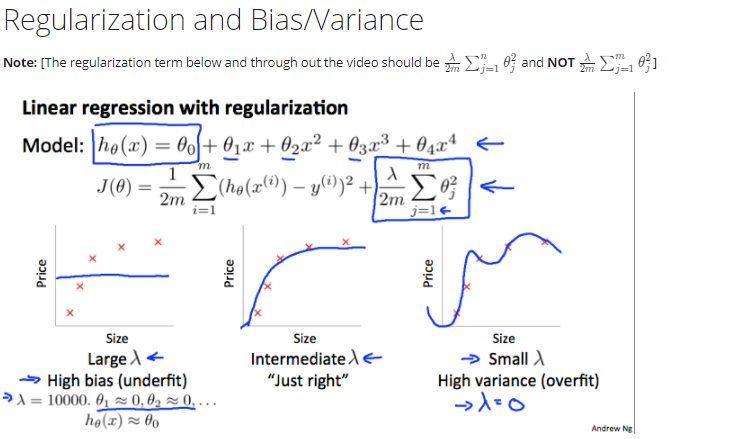
## Bias vs. Variance

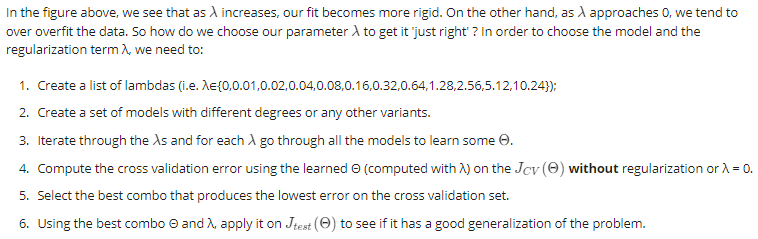
Diagnosing Bias vs. Variance



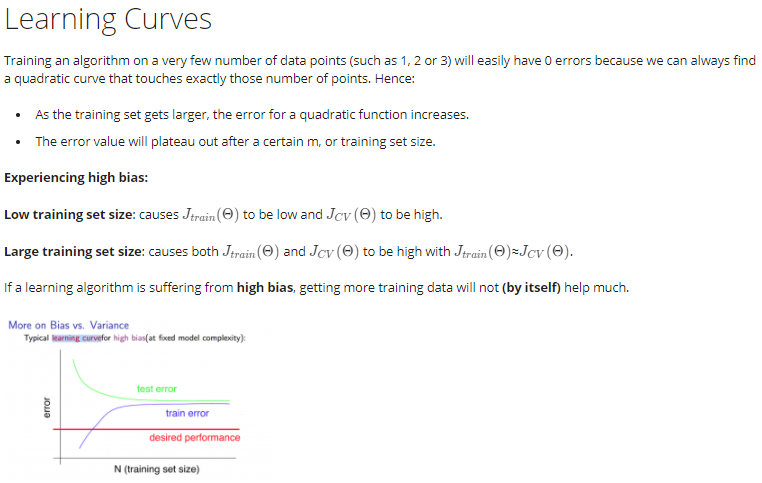
Regularization and Bias/Variance

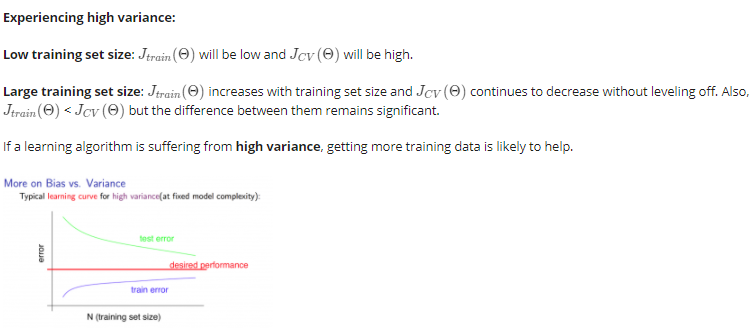
* set of models? min J?





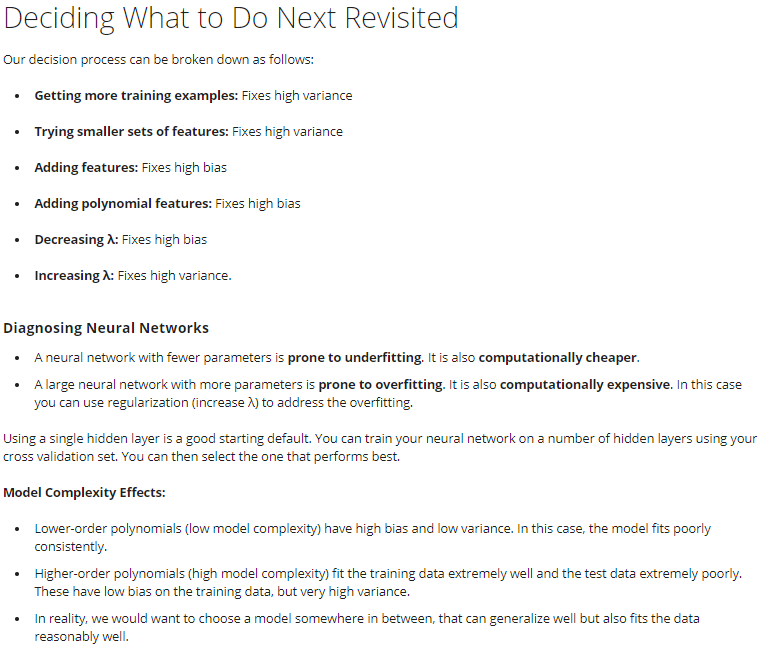
Learning Curves





Deciding What to Do Next Revisited

* Better to use more neural network hidden units then address overfitting (increase λ) than have underfitting



## Building a Spam Classifier

Prioritizing What to Work On

* *Spam classification example*