

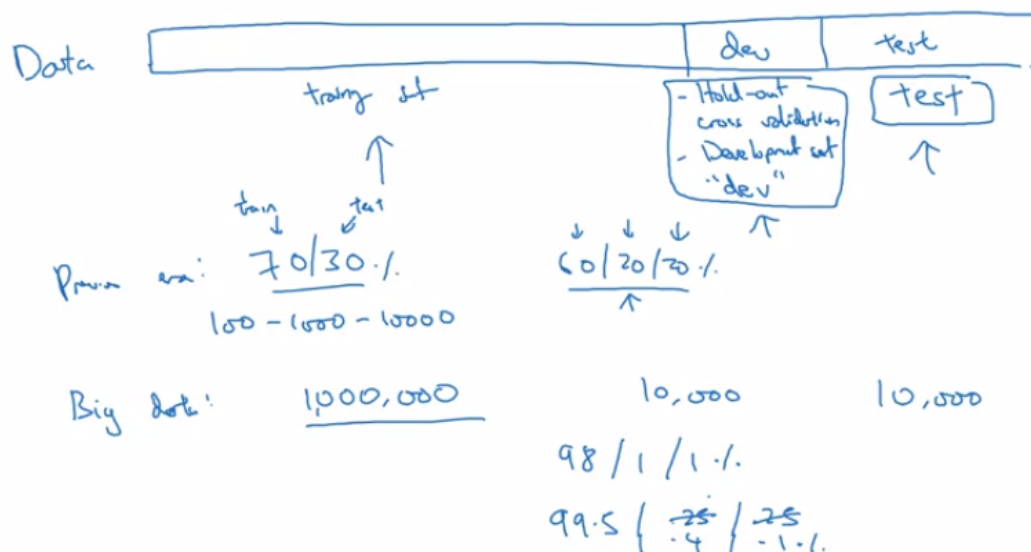
## Week 1-1 Basic Recipe for ML & NN

笔记本: DL 2 - Deep NN Hyperparameter Tunning, Regularization & Optimization

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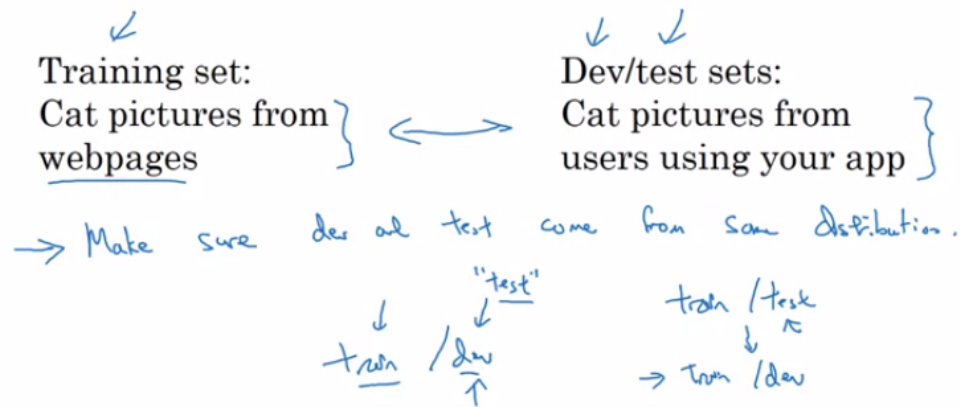
### Train/dev/test sets



### Train/dev(CV)/test sets

# Mismatched train/test distribution

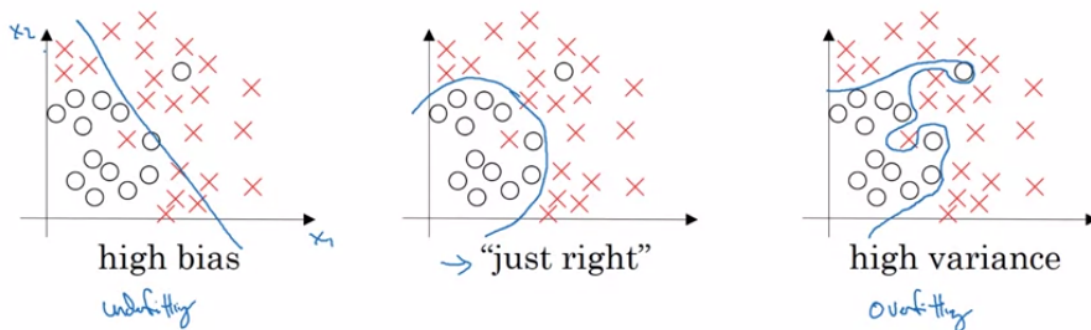
Courts



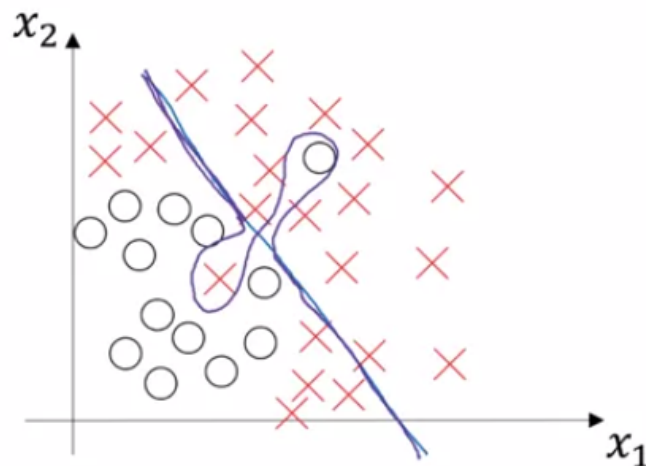
Not having a test set might be okay. (Only dev set.)

## dev & test from same distribution

### Bias and Variance



## High bias and high variance



# Bias and Variance

## Bias and Variance

Cat classification

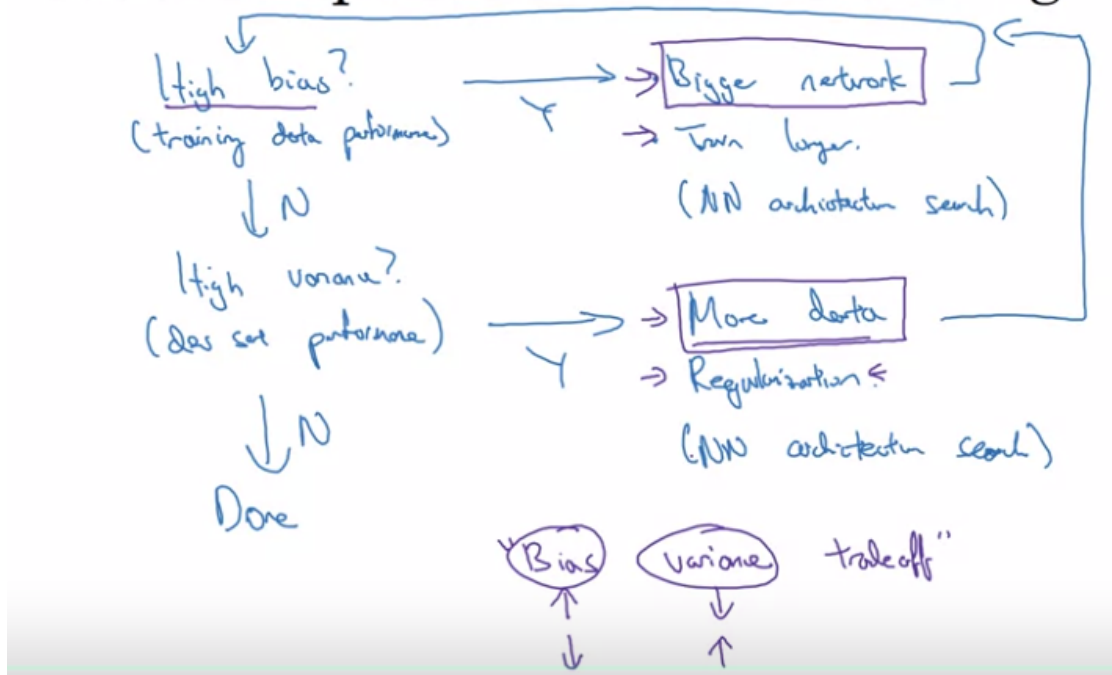


Train set error:	10%	15% ↙	15%	0.5%
Dev set error:	110%	16% ↙	30%	1%
	high variance	high bias ↑	high bias & high variance	low bias low variance
Human: 20%				
Optimal (Bayes) error: 15%				

Blurry images

(Optimal / Bayes) error: e.g., human 0%

## Basic recipe for machine learning



we now have tools to drive down bias and just drive down bias, or

drive down variance and just drive down variance, without really **hurting the other thing that much.** And I think this has been one of the big reasons that deep learning has been so useful for supervised learning, that there's much less of this tradeoff where you have to carefully balance bias and variance, but sometimes you just have more options for reducing bias or reducing variance without necessarily increasing the other one.

(well-regularization + bigger NN)