



deeplearning.ai

# Comparing to human-level performance

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**Improving your model  
performance**

# The two fundamental assumptions of supervised learning

1. You can fit the training set pretty well.



~ Avoidable bias

2. The training set performance generalizes pretty well to the dev/test set.



~ Variance

# Reducing (avoidable) bias and variance

Human-level



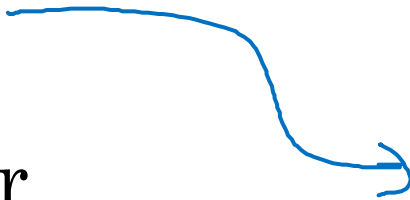
Avoidable bias



Training error



Variance



Dev error

Train bigger model

Train longer/better optimization algorithms

- momentum, RMSprop, Adam

NN architecture/hyperparameters search

RNN  
CNN

More data

Regularization

-  $L_2$ , dropout, data augmentation

NN architecture/hyperparameters search