deeplearning.ai

Mismatched training and dev/test data

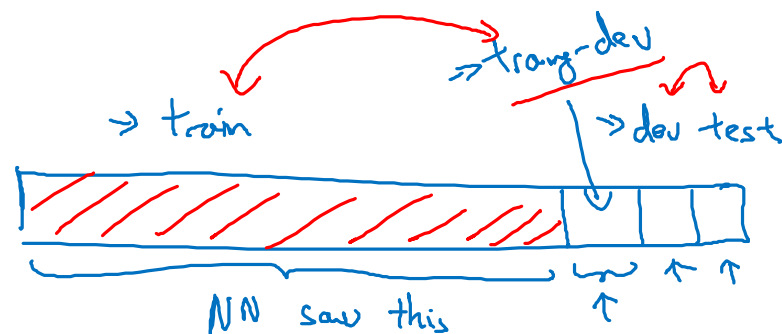Bias and Variance with mismatched data distributions

Cat classifier example

Assume humans get ≈ 0% error.

Training error ···· 1%
Dev error ········· 10% ↓ 9%

Training-dev set: Same distribution as training set, but not used for training

→ train   →→ traing-dev
→ dev test

NN saw this

Traing error	1%	1%
→ Traing-dev error	9%	1.5%
→ Dev error	10%	10%

↓ variance   ↑ data mismatch

Variance

Human error ·····	0%		$\uparrow$ Avoidable bias
Traing error	10% ↓ Avoidable bias	10%	
Traing-dev error	11%	11% ↓ Variance	
Dev error	12%	20% ↑ Data mismatch	

Bias   Bias + Data mismatch

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Bias/variance on mismatched training and dev/test sets

Human level   4% ↑ } avoidable bias   4%

Traing set error   7% ↑ } variance   7% }

Traing - dev set error   10% ↑ } data mismatch   10% }

→ Dev error   12% ↑ } degree of overfitting   6% }

→ Test error   12%   to dev set.   6% }

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More general formulation

	General speech recognition	Rearview mirror speech data.
Human level	"Human level" 4%	6%
Error on examples trained on	"Training error" 7%	6%
Error on examples not trained on	"Training-dev error" 10%	"Dev/Test error" 6%

Avoidable bias

Variance

data mismatch

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