deeplearning.ai

Mismatched training and dev/test data
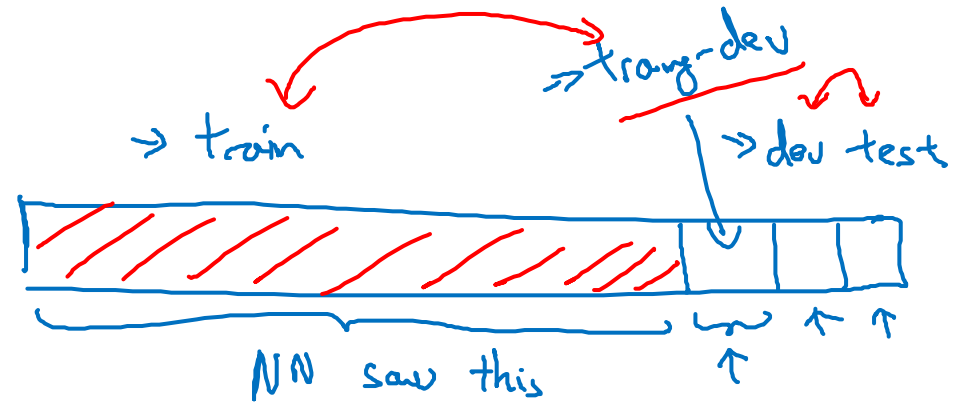

Bias and Variance with mismatched data distributions

Cat classifier example

Assume humans get ≈ 0% error.
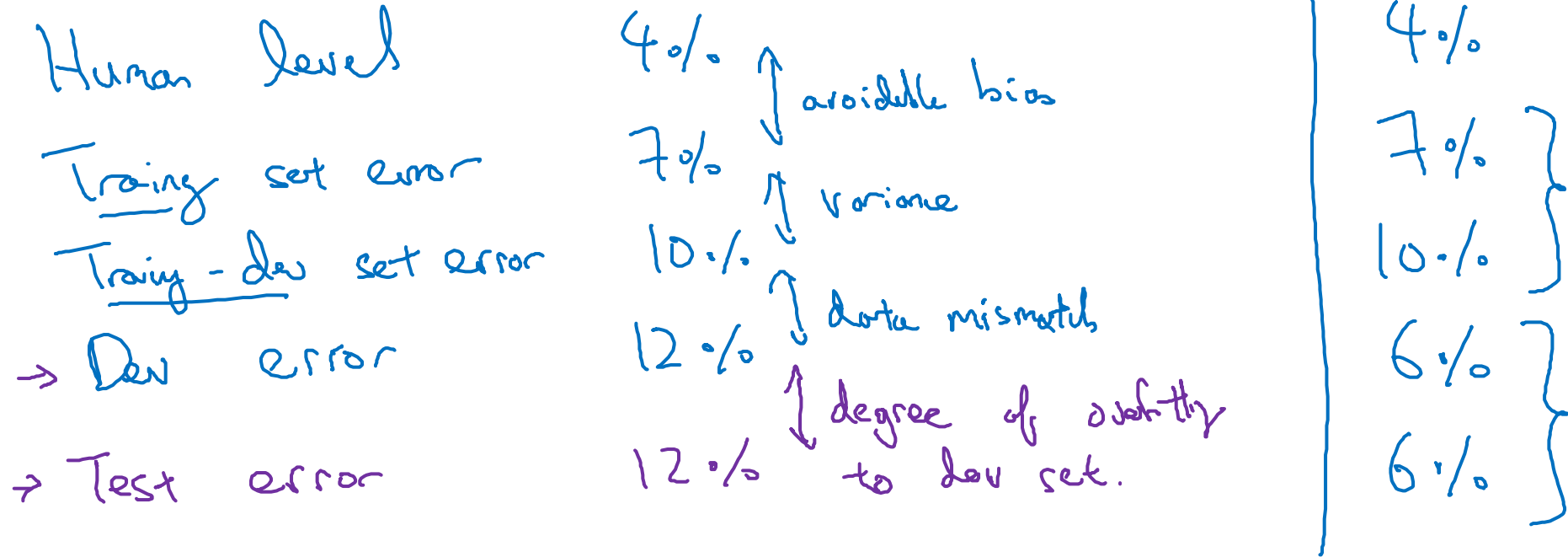
Training error........ 1%

Dev error............. 10% ↓ 9%

→ train   → Traing-dev
→ dev test

NN saw this

Traing error	1%	1%
→ Traing-dev error	9% ↓ Variance	1.5% ↑
→ Dev error	10%	10% ↓ data mismatch

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

	Variance	
Human error -----	0% ↕ Avoidable bias	↕ Avoidable bias
Traing error	10%	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
Training set error   7%
                                             ↑ variance
Training - dev set error   10%
                                             ↑ data mismatch
→ Dev   error   12%
                                             { degree of overfitting
→ Test   error   12%   to dev set.

4%

7% }

10% }

6% }

6% }

More general formulation

Rearview Mirror

	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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