

Week 1 all notes

1. Orthogonality: the process of choosing the correct parameters and tune in the improvement required to make our model more effective.
2. End to end deep learning: more data is required.
3. Chain of assumptions in ml:
 1. Fit training set well on cost functions: if not then try to get a bigger network or fix optimization function like Adam optimization.
 2. Fit dev set well or apply regularization and use bigger training set.
 3. Fit test set well on the cost function or use bigger dev set.
 4. Perform well on the real world either change dev set or cost function.
 5. Difference b/w training error and dev error: variance and difference b/w human/ Bayesian error and training error is called avoidable bias.
 6. Accuracy = precision/recall
 7. Precision = percentage of true positive results with the overall positive results.
 8. Recall = percentage of true positive result over the true results(true positive + true negative)
 9. Accuracy = actual true results/overall all results.

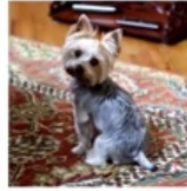
For multiplication evaluation metric, choose the evaluation metric which have a better harmonic mean is selected.

10. 98 percent 1 percent and 1 percent is new /modern approach towards splitting data towards training set, dev set and test set.
11. Geoffrey Hinton Interview:
 1. Trust your intuition if though other people considers it as a silly idea.
 2. Unsupervised learning will have a more powerful future than supervised learning.

Week 2 all notes

Error Analysis :

Look at dev examples to evaluate ideas



90% accuracy
→ 10% error

Should you try to make your cat classifier do better on dogs? ←

Error analysis:

- Get ~100 mislabeled dev set examples.
- Count up how many are dogs.

"ceiling"

5%
5/100

10%
95%

50%
50/100

10%
5%

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Ceiling on performance : The machine learning

Error Analysis : What is the most important direction to focus on

Evaluate multiple ideas in parallel

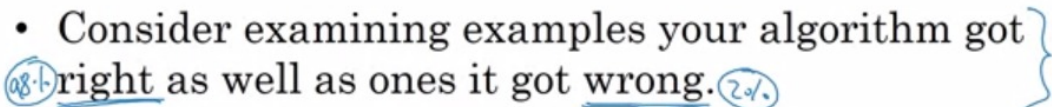
Ideas for cat detection:

- Fix pictures of dogs being recognized as cats ←
- Fix great cats (lions, panthers, etc..) being misrecognized ←
- Improve performance on blurry images ←

Image	Dog	Great Cats	Blurry	Instagram	Comments
1	✓			✓	Pitbull
2			✓	✓	
3		✓	✓		Rainy day at zoo
⋮	⋮	⋮	⋮		
% of total	8%	43%	61%	12%	

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Correcting incorrect dev/test set examples

- Apply same process to your dev and test sets to make sure they continue to come from the same distribution
- Consider examining examples your algorithm got right as well as ones it got wrong.

- Train and dev/test data may now come from slightly different distributions.

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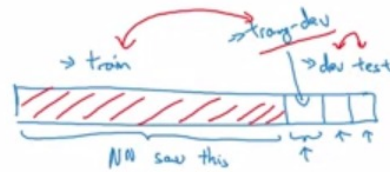
Built your first system quickly and then reiterate.

Cat classifier example

Assume humans get $\approx 0\%$ error.

Training error 1%
 Dev error 10%

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



Training error	1%	1%
→ Training-dev error	9%	1.5%
→ Dev error	10%	10%
	Variance	mismatch

Training error

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More general formulation

	Gravel speech recognition	Reveries mirror speech data.	
Human level	"Human level" 4%	6%	↑ avoidable bias ↑ Variance
Error on examples trained on	"Training error" 7%	6%	
Error on examples <u>not</u> trained on	"Training-dev error" 10%	"Dev/Test error" 6%	

← data mismatch →

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