



deeplearning.ai

Error Analysis

Carrying out 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: → 5-10 min

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

→ 50%
5 / 100

10%
↓
95%

"Ceiling"
→ 50%.
50 / 100

100%.
↓
50%

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	<u>8%</u>	<u>43%</u>	<u>61%</u>	<u>12%</u>	



deeplearning.ai

Error Analysis

Cleaning up
Incorrectly labeled
data

Incorrectly labeled examples

x



y

1

0

1

1

0

Training set.

DL algorithms are quite robust to random errors in the training set.

Systematic errors

Error analysis



Image	Dog	Great Cat	Blurry	Incorrectly labeled	Comments
...					
98				✓	Labeler missed cat in background
99		✓			
100				✓	Drawing of a cat; Not a real cat.
% of total	<u>8%</u>	<u>43%</u>	<u>61%</u>	<u>6%</u>	

Overall dev set error 100%

Errors due incorrect labels 0.6% ←

Errors due to other causes 9.4% ←

2% ←

0.6% ←

1.4% ←

2.1%

1.9%

Goal of dev set is to help you select between two classifiers A & B.

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.
(8.6%) *(20%)*
- Train and dev/test data may now come from slightly different distributions.

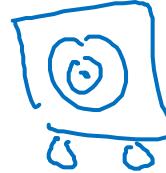


deeplearning.ai

Error Analysis

Build your first system
quickly, then iterate

Speech recognition example



- • Noisy background
 - • Café noise
 - • Car noise
 - • Accent
 - • Far from
 - • Young
 - • Stutter
 - • ...
- Guideline:**
Build your first system quickly,
then iterate
- • Set up dev/test set and metric
 - Build initial system quickly
 - Use Bias/Variance analysis & Error analysis to prioritize next steps.



deeplearning.ai

Mismatched training
and dev/test data

Training and testing
on different
distributions