Photo OCR

Problem Description and Pipeline

1. Text Detection
2. Character Segmentation
3. Character Classification

Sliding Windows

slide rectangle across image by step-size/stride, at multiple sizes

"expansion" operator

Getting Lots of Data and Artificial Data

1. Make sure you have a low bias classifier before expanding the effort. (Plot learning curves)
2. "How much would it take to get 10x as much data as we currently have?"
   - Artificial Data Synthesis
   - Collect/label it yourself
   - "Crowd Source" (E.g. Amazon Mechanical Turk)

Ceiling Analysis: What Part of the Pipeline to Work on Next

Estimating the error to each component (ceiling analysis)
What part should we spend most time to improve?

Component	Accuracy

Overall System	72%	17%
Text Detection	89%	1% (simulate TD gets 100% accuracy, give test set right answ)
Character Segmentation	90%	10% ↓
Character Recognition	100%	↓

Conclusion

Supervised Learning $(x^{(i)}, y^{(i)})$

- Linear regression, Logistic regression, neural networks, SVMs

Unsupervised Learning $x^{(i)}$

- K-means, PCA, Anomaly detection

Special applications / special topics

- Recommender systems, large scale machine learning

Advice on building a machine learning system

- Bias/variance, regularization; deciding what to work on next: evaluation of learning algorithms, learning curves, error analysis, ceiling analysis