deeplearning.ai

Comparing to human-level performance

Surpassing human-level performance

Surpassing human-level performance

Team of humans 0.5%

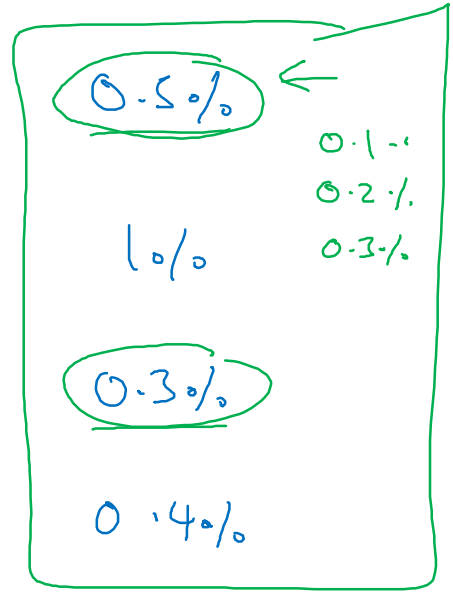
One human 1%

Training error 0.6%

Dev error 0.8%

0.1

0.2



What is avoidable bias?

Problems where ML significantly surpasses human-level performance

- Online advertising
- Product recommendations
- Logistics (predicting transit time) 物流
- Loan approvals

Structural data

Not natural perception 自然感知任务 (CV, NLP ...)

lots of data

- Speech recognition
- Some image recognition
- Medical
  - ECG, Skin cancer, ...

Surpassing human-level performance

Example1: Classification task

	Classification error (%)	
	Scenario A	Scenario B
Team of humans	0.5	0.5
One human	1.0	1
Training error	0.6	0.3
Development error	0.8	0.4

Scenario A

In this case, the Bayes error is 0.5%, therefore the available bias is 0.1% et the variance is 0.2%.

Scenario B

In this case, there is not enough information to know if bias reduction or variance reduction has to be done on the algorithm. It doesn't mean that the model cannot be improve, it means that the conventional ways to know if bias reduction or variance reduction are not working in this case.

There are many problems where machine learning significantly surpasses human-level performance, especially with structured data:

- Online advertising
- Product recommendations
- Logistics (predicting transit time)
- Loan approvals