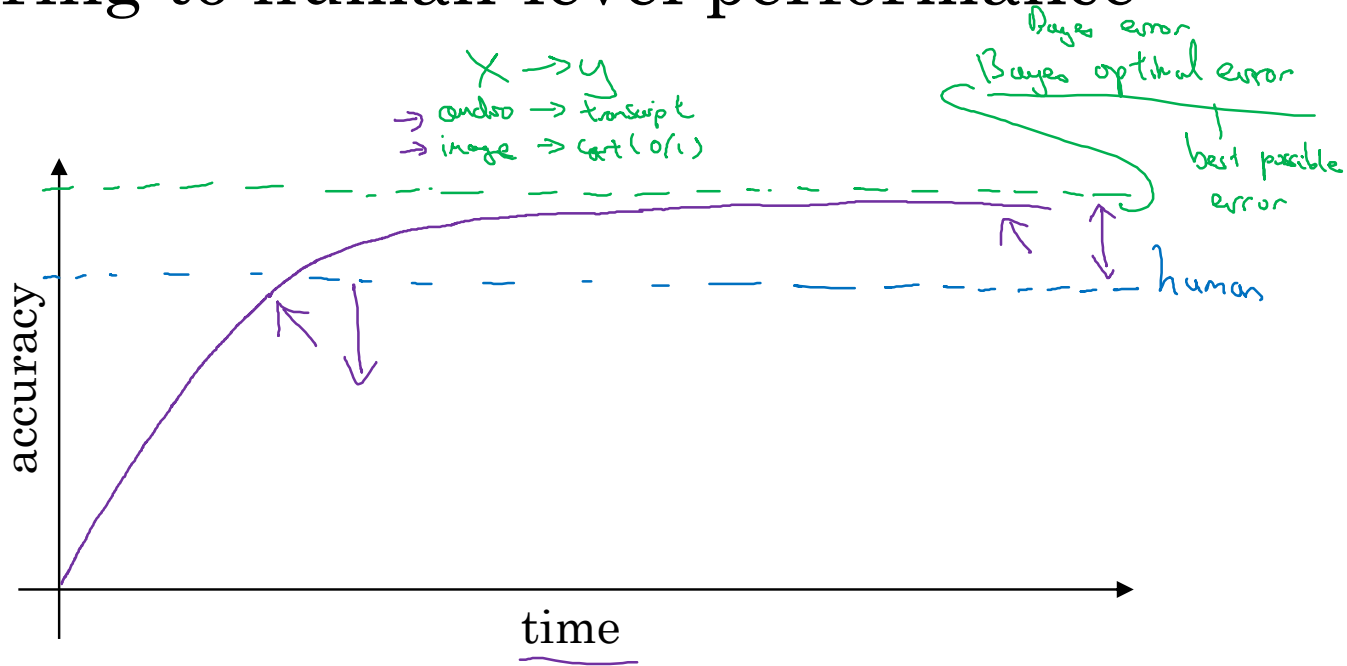deeplearning.ai

Comparing to human-level performance

Why human-level performance?

Comparing to human-level performance

$X \rightarrow y$

$\rightarrow$ audio $\rightarrow$ transcript
$\rightarrow$ image $\rightarrow$ cat (0/1)

Bayes error
Bayes optimal error

best possible error

human

accuracy

time

Andrew Ng

Why compare to human-level performance

Humans are quite good at a lot of tasks. So long as ML is worse than humans, you can:
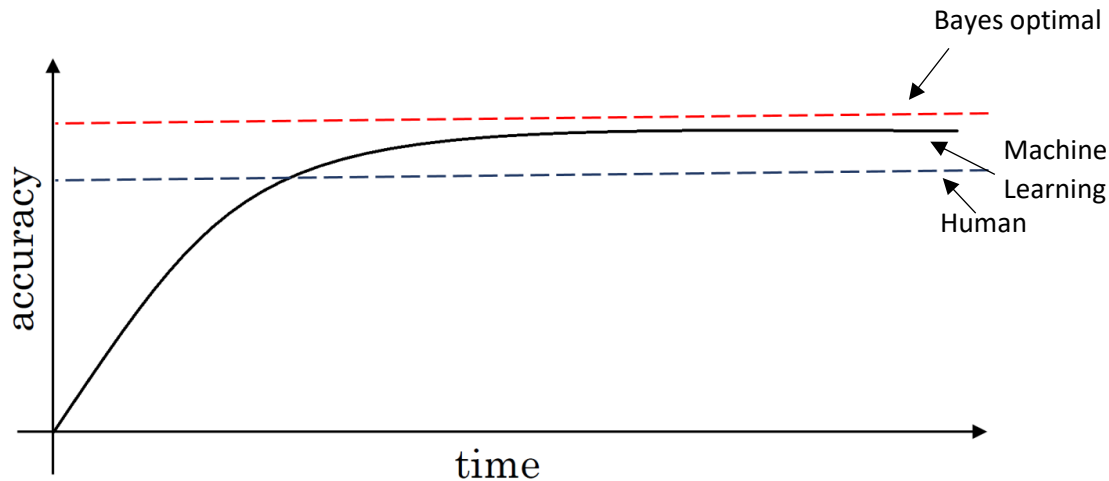
- Get labeled data from humans. (x, y)

- Gain insight from manual error analysis:
  Why did a person get this right?

- Better analysis of bias/variance.

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Why human-level performance?

Today, machine learning algorithms can compete with human-level performance since they are more productive and more feasible in a lot of application. Also, the workflow of designing and building a machine learning system, is much more efficient than before.

Moreover, some of the tasks that humans do are close to ''perfection'', which is why machine learning tries to mimic human-level performance.

The graph below shows the performance of humans and machine learning over time.

The

Machine learning progresses slowly when it surpasses human-level performance. One of the reason is that human-level performance can be close to Bayes optimal error, especially for natural perception problem.

Bayes optimal error is defined as the best possible error. In other words, it means that any functions mapping from x to y can't surpass a certain level of accuracy.

Also, when the performance of machine learning is worse than the performance of humans, you can improve it with different tools. They are harder to use once its surpasses human-level performance.

These tools are:

- Get labeled data from humans
- Gain insight from manual error analysis: Why did a person get this right?
- Better analysis of bias/variance.