



deeplearning.ai

# End-to-end deep learning

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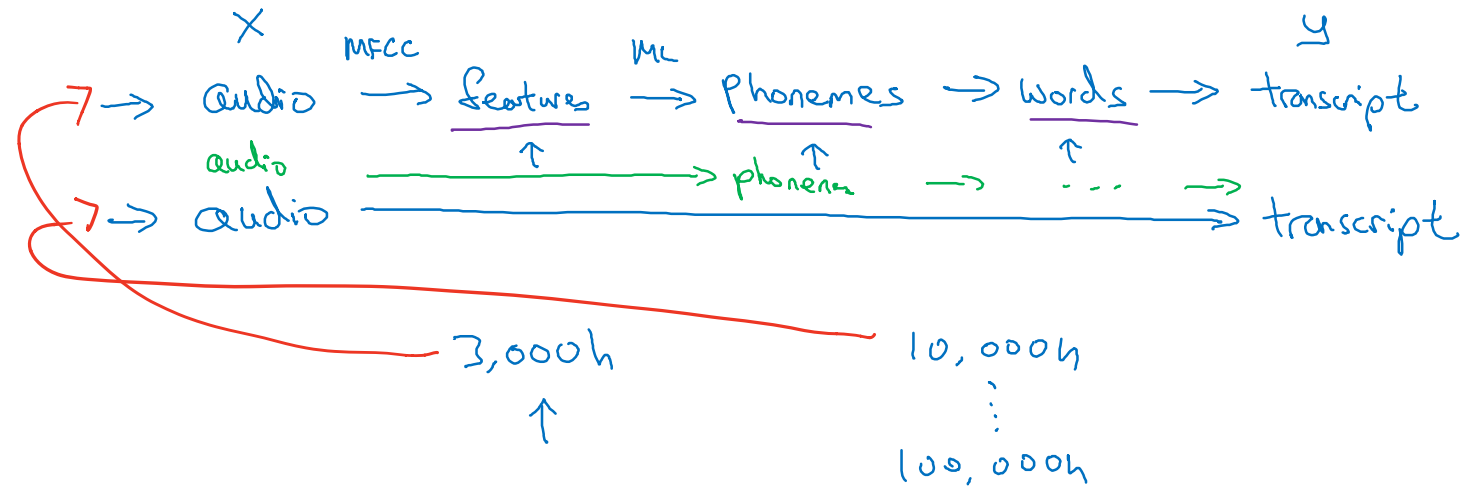
*enough  
data*

## What is end-to-end deep learning

# What is end-to-end learning? (x $\longrightarrow$ y)

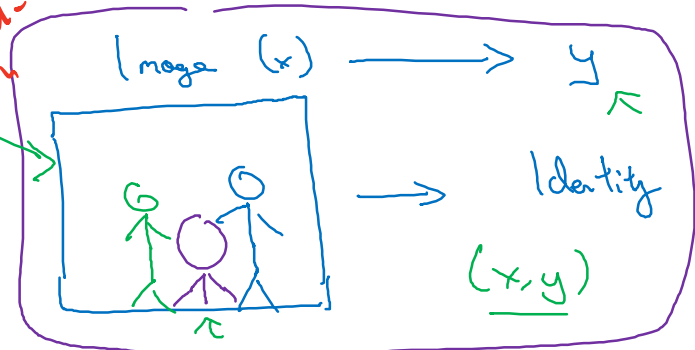
## Speech recognition example

"cat"



# Face recognition

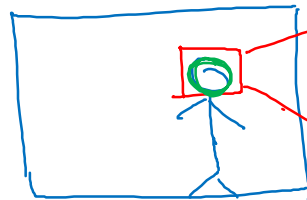
not enough data  
to solve this end-  
to-end problem



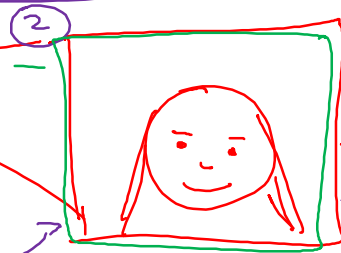
[Image courtesy of Baidu]

better

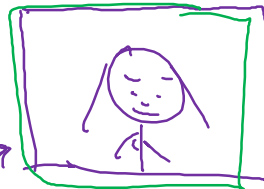
①



$(x, y)$   
↑  
↑



Identity

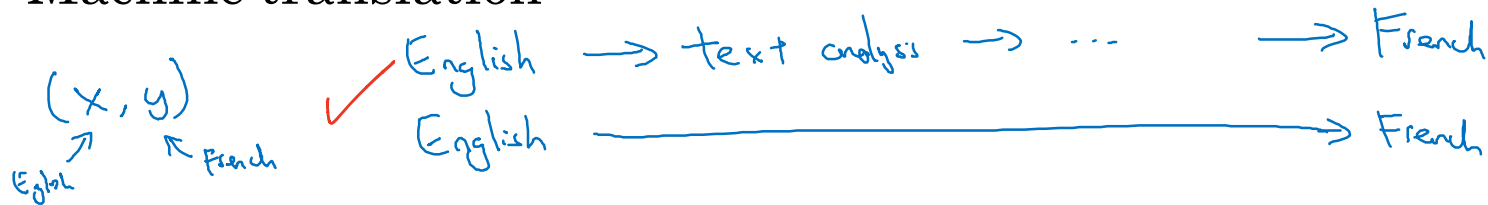


Same person?

enough  
Have ✓ data for each  
of 2 subtasks.

# More examples

## Machine translation



## Estimating child's age:



X

Image  $\xrightarrow{\textcircled{1}}$  bones  $\xrightarrow{\textcircled{2}}$  age

Image  $\longrightarrow$  age  $\longleftarrow$