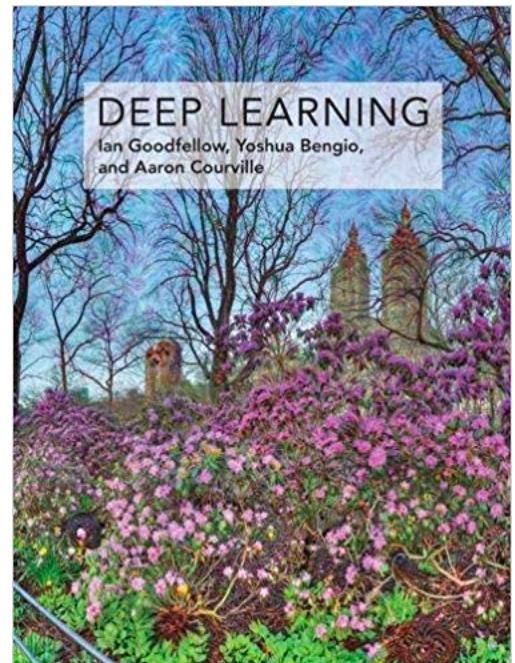


Course material at: <https://git.io/fjFga>

# Introduction to Deep Neural Networks

Wednesday, Lecture 1  
FASE ML Bootcamp

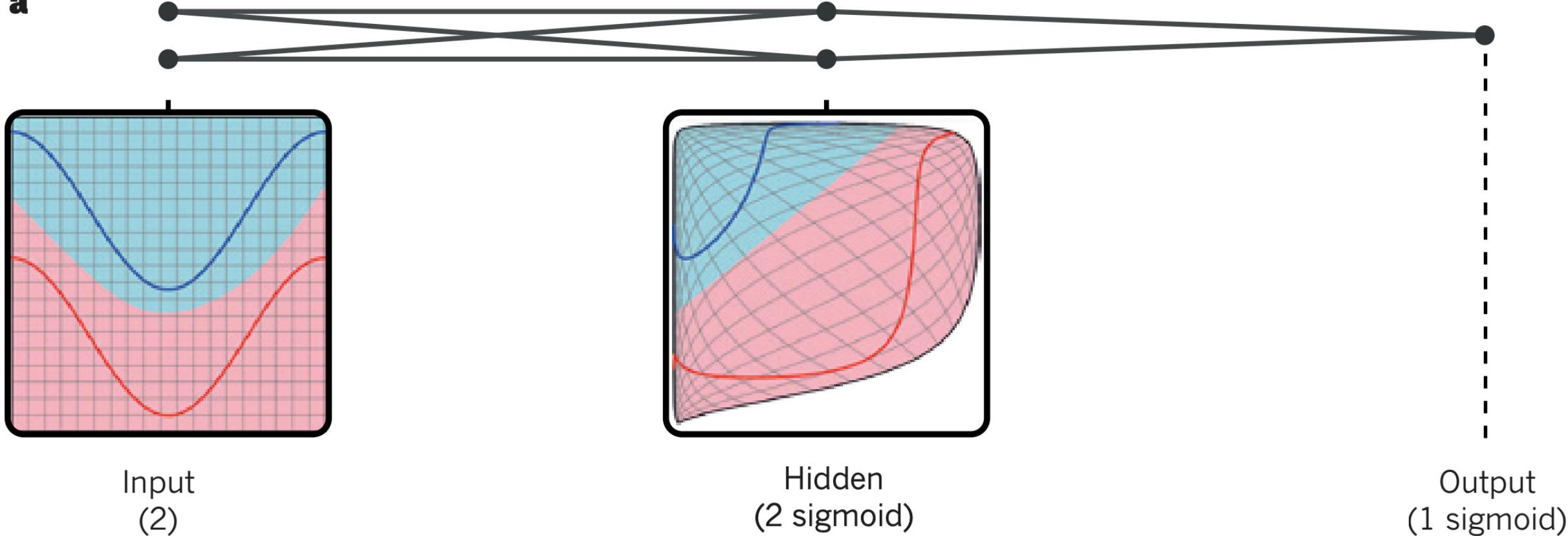
Based on material from:  
3blue1brown on YouTube,  
Andrew Ng, Stanford CS230,  
Deep learning, Nature review



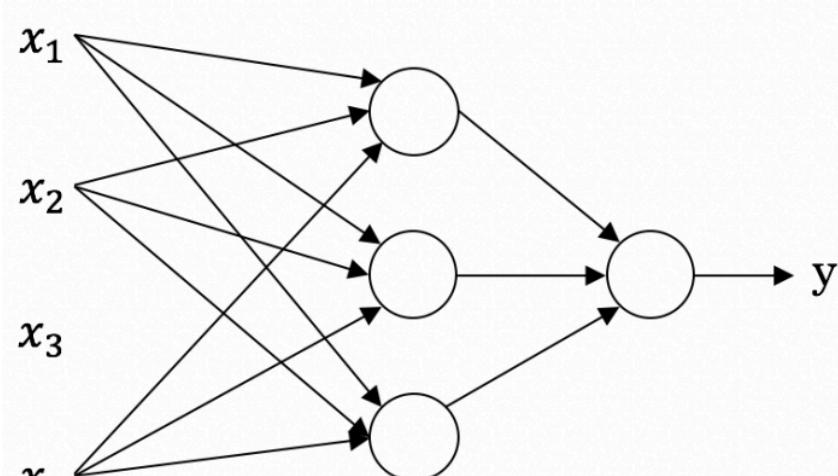
# Supervised learning

Input(x)	Output (y)	Application
Home features	Price	Real Estate
Ad, user info	Click on ad? (0/1)	Online Advertising
Image	Object (1,...,1000)	Photo tagging
Audio	Text transcript	Speech recognition
English	Chinese	Machine translation
Image, Radar info	Position of other cars	Autonomous driving

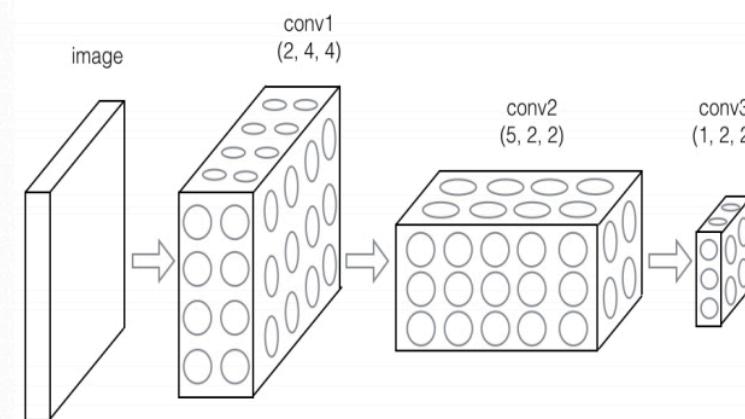
# A simple neural net

**a**

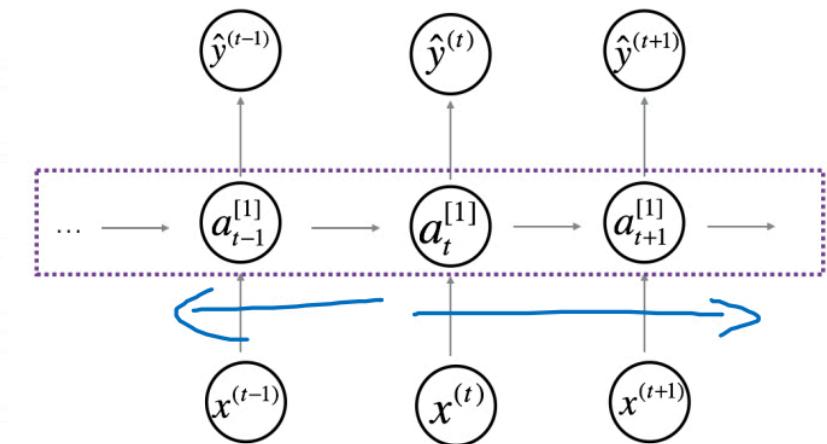
# Neural Network types



Standard NN

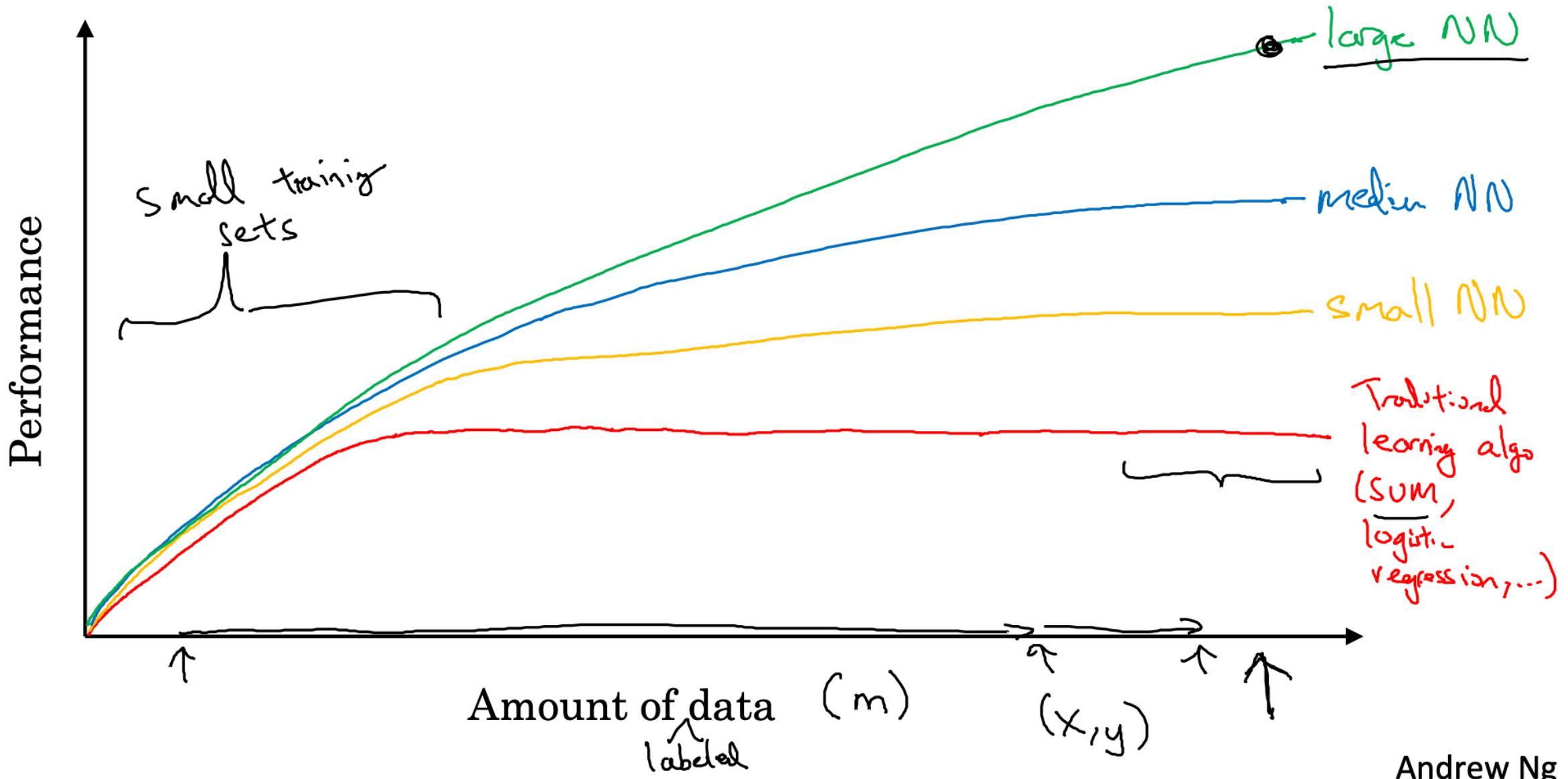


Convolutional NN



Recurrent NN

# Scale drives deep learning



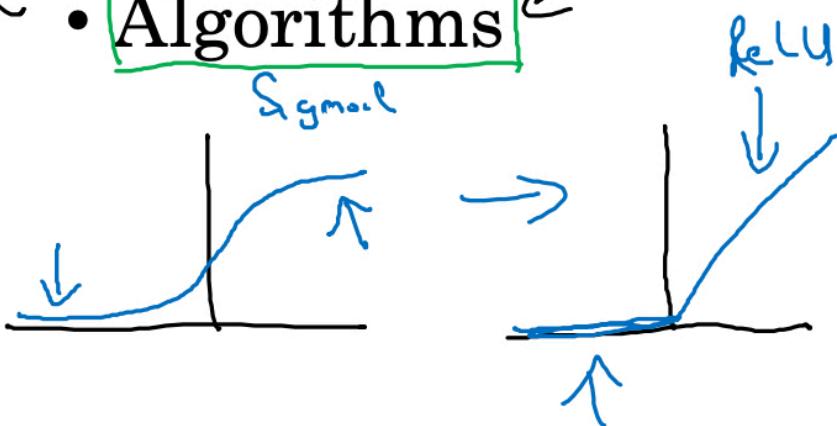
From Andrew Ng's slides, Stanford CS230

# Scale drives deep learning progress

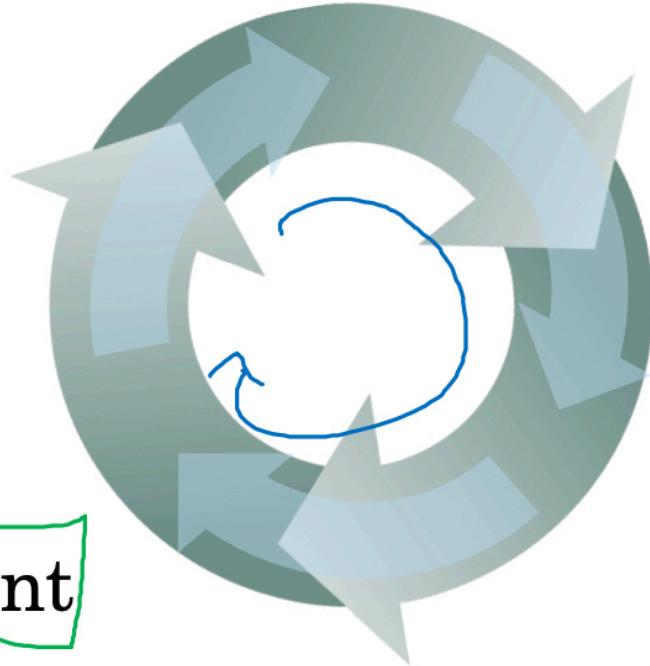
- Data

- Computation

- Algorithms

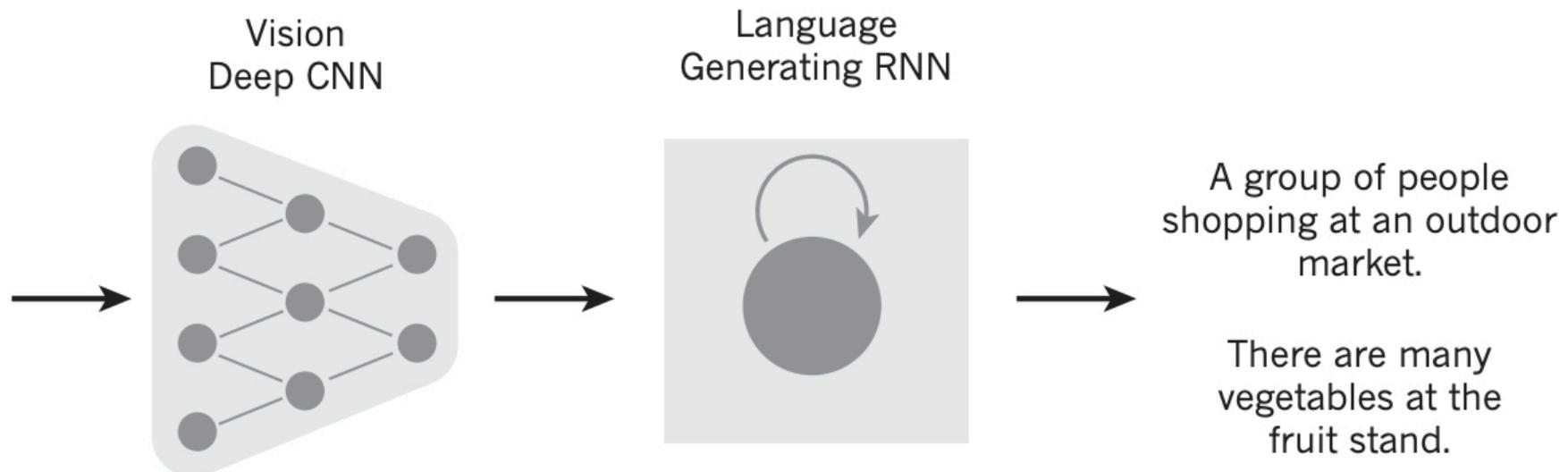


Idea



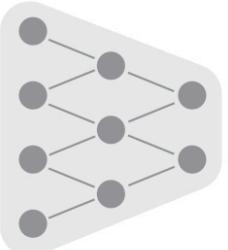
Code

10 min  
1 day  
1 month





Vision  
Deep CNN



Language  
Generating RNN



A group of people  
shopping at an outdoor  
market.

There are many  
vegetables at the  
fruit stand.



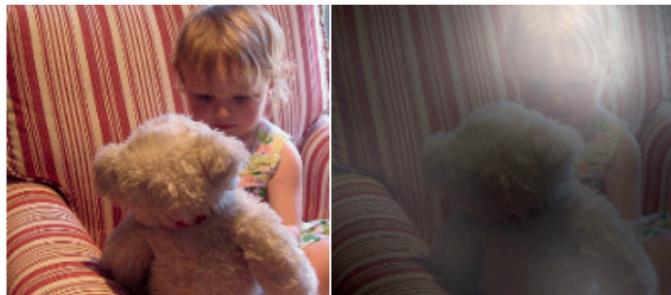
A woman is throwing a **frisbee** in a park.



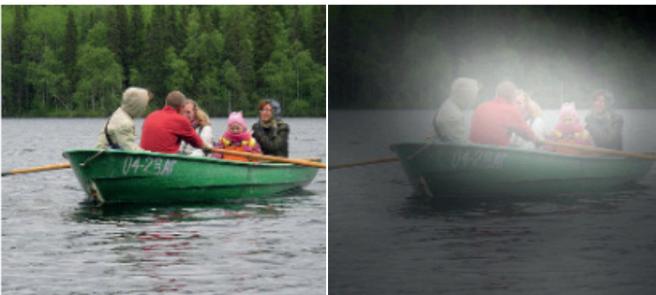
A **dog** is standing on a hardwood floor.



A **stop** sign is on a road with a  
mountain in the background



A little **girl** sitting on a bed with a teddy bear.



A group of **people** sitting on a boat in the water.



A giraffe standing in a forest with  
**trees** in the background.

# How do neural networks train?

<https://www.3blue1brown.com/neural-networks>

1<sup>st</sup> video

For written notes describing the content in the videos, this is a great resource

<http://neuralnetworksanddeeplearning.com/index.html>