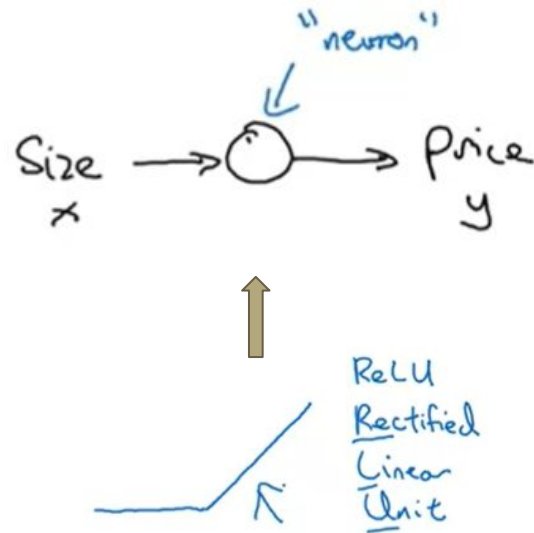
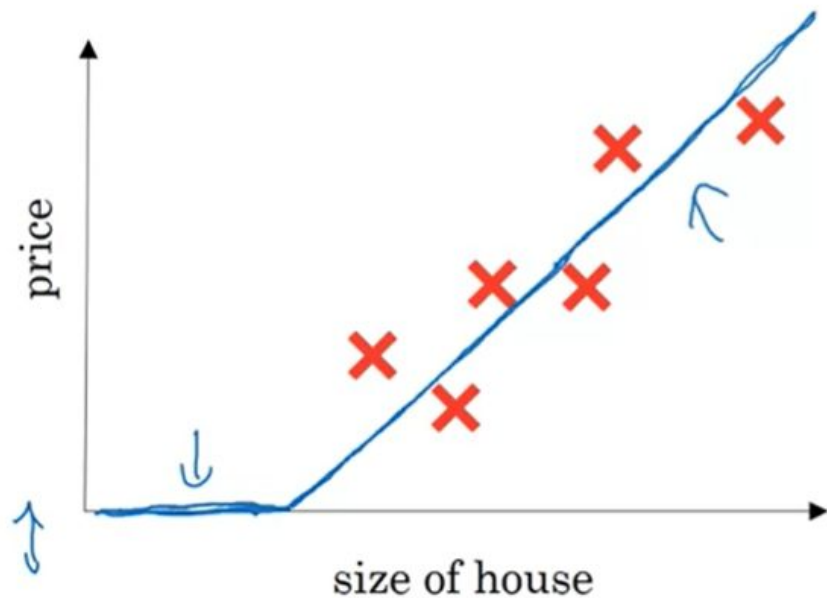

INTRODUCTION TO DEEP LEARNING

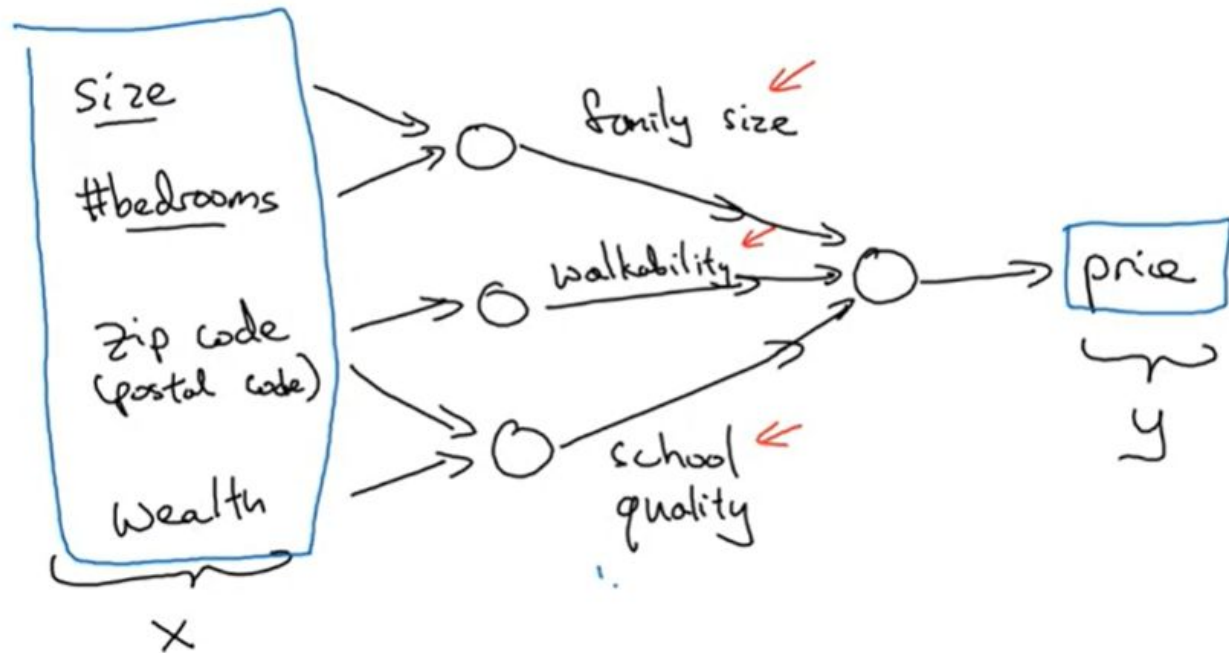
Andrew NG

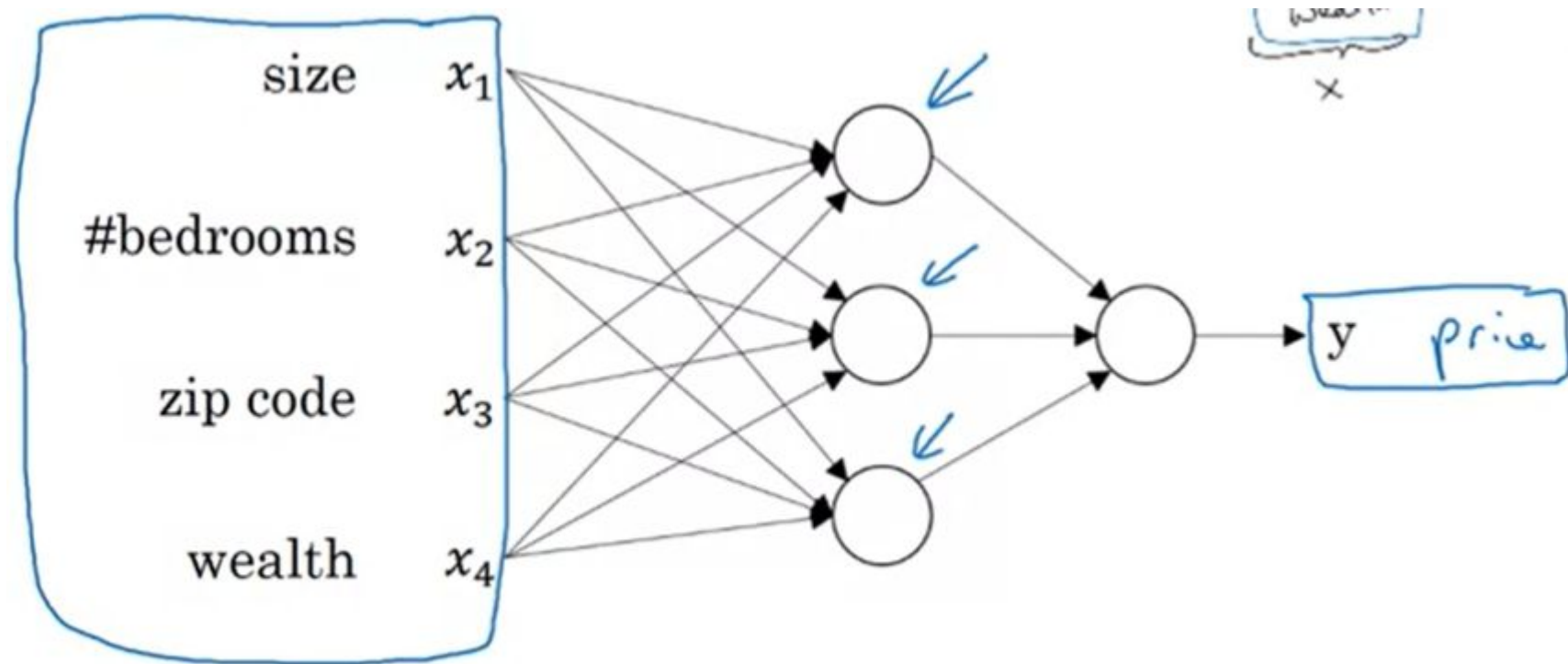
What is a Neural Network?

Housing Price Prediction



Housing Price Prediction



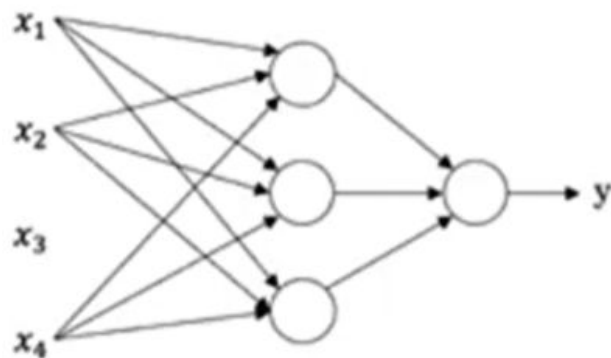


Supervised Learning with Neural Networks

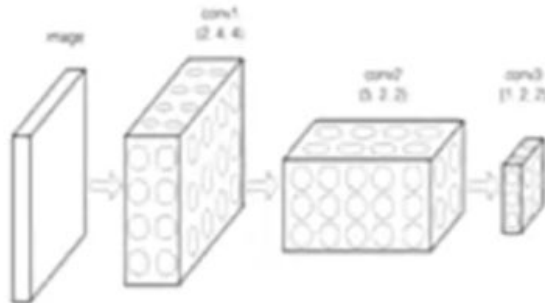
Supervised Learning

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

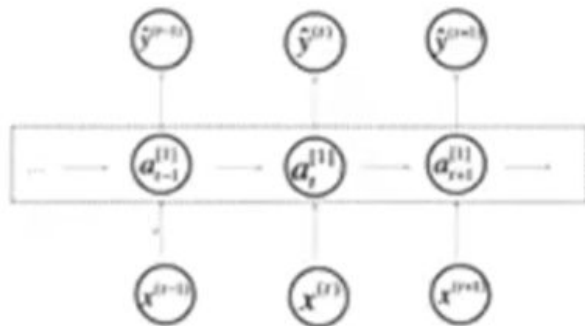
Neural Network examples



Standard NN



Convolutional NN



Recurrent NN

Supervised Learning

Structured Data



Size	#bedrooms	...	Price (1000\$s)
2104	3		400
1600	3		330
2400	3		369
⋮	⋮		⋮
3000	4		540

Unstructured Data

User Age	Ad Id	...	Click
41	93242		1
80	93287		0
18	87312		1
⋮	⋮		⋮
27	71244		1

Supervised Learning

Structured Data

Size	#bedrooms	...	Price (1000\$s)
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⋮	⋮		⋮
27	71244		1

Unstructured Data



Audio



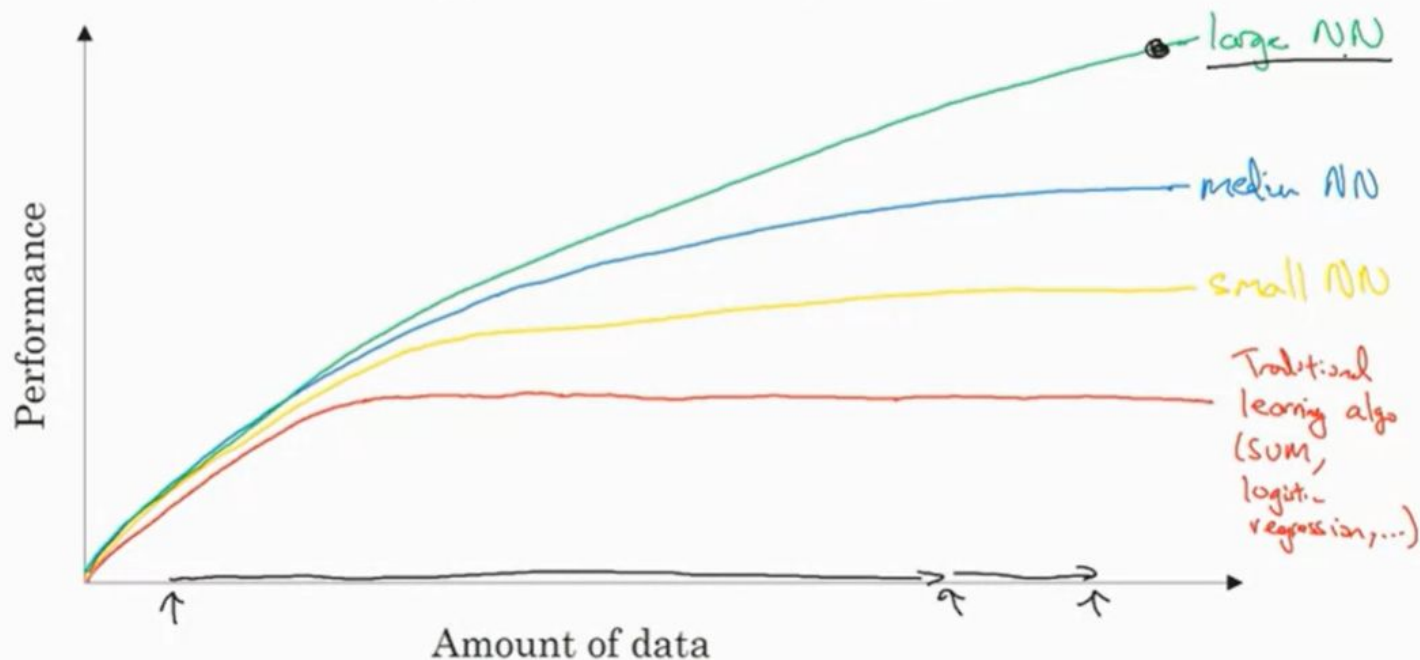
Image

Four scores and seven
years ago...

Text

Why is Deep Learning taking off?

Scale drives deep learning progress



Scale drives deep learning progress

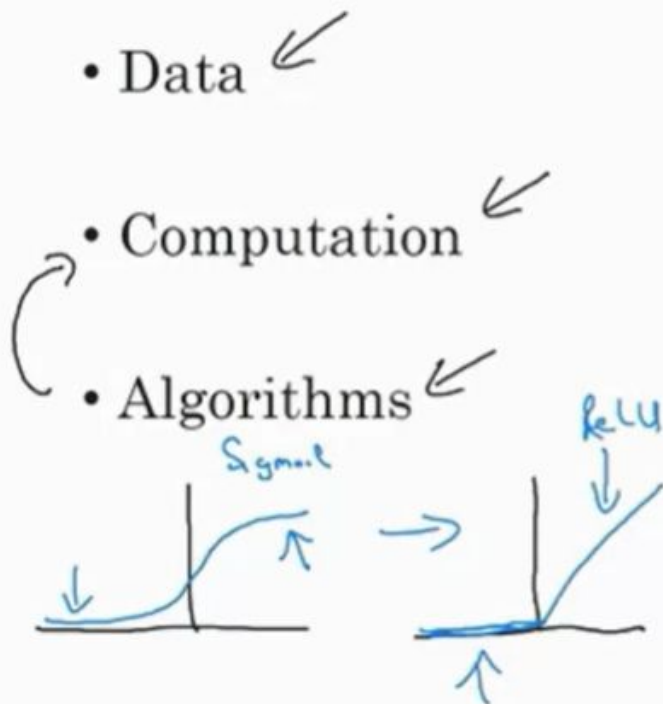
- Data ↙
- Computation ↙
- Algorithms

Scale drives deep learning progress

- Data ↙

- Computation ↙

- Algorithms ↙

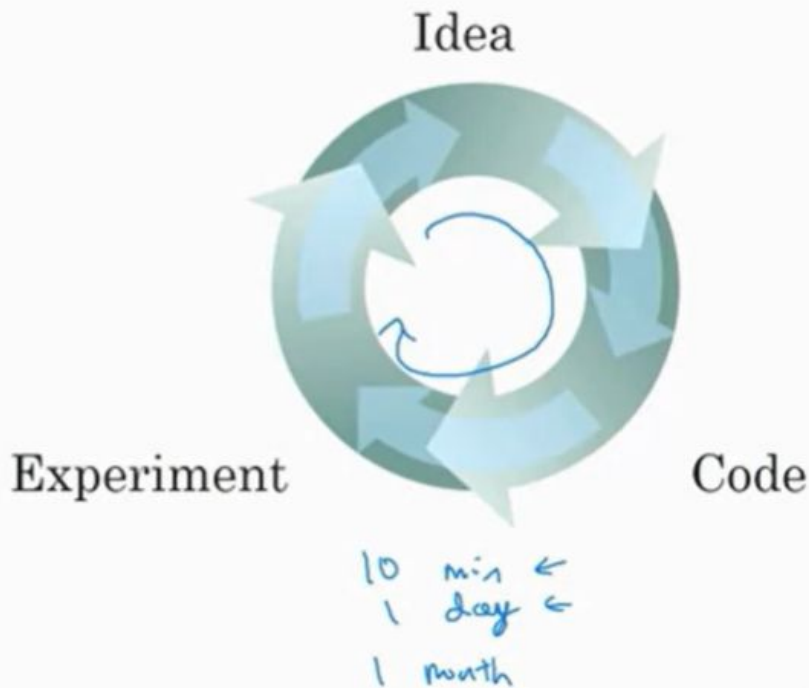
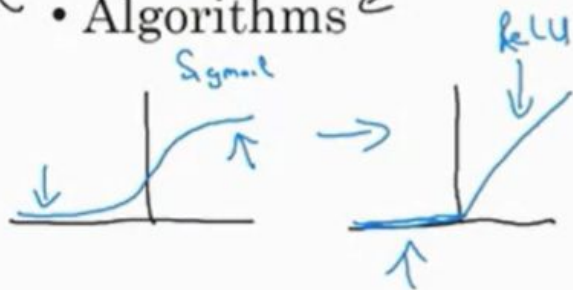


Scale drives deep learning progress

- Data

- Computation

- Algorithms



Pregunta

Would structured or unstructured data have features such as pixel values or individual words?

- ☒ Structured data.
 - ☐ Unstructured data
-