Deep Learning Specialization

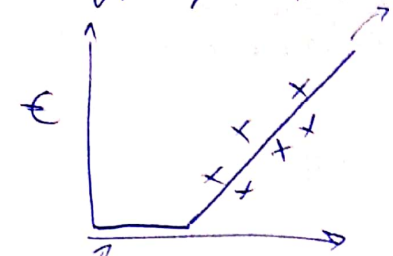
Course 1 | Week 1

Contact: feedback@deeplearning.ai

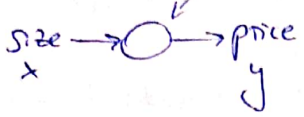
What is a NN?

DL → training ANNs

Housing price prediction

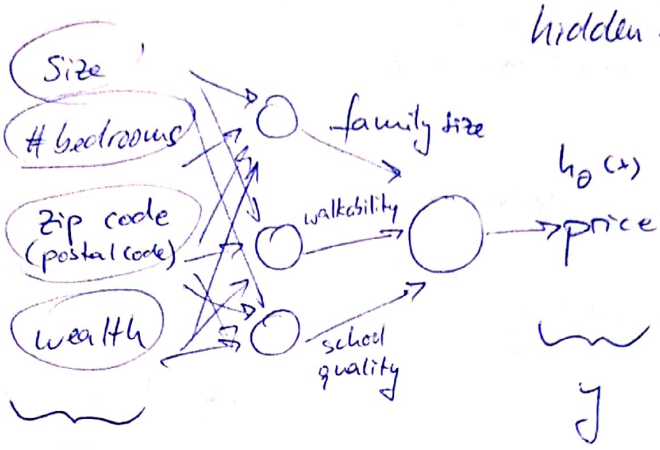


ReLU function



→ ReLU
Rectified Linear Unit

for training give x and y

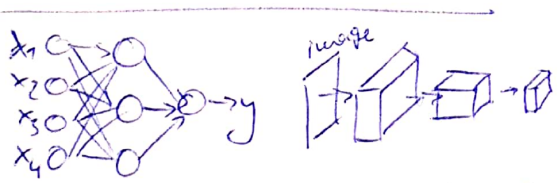


every input layer is interconnected to every hidden layer feature

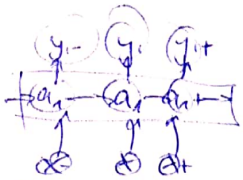
Supervised Learning with ANNs

Input (x)	Output (y)	Application	
Home features	Price	Real Estate	Standard ANN
Ad, user info	Click on Ad? (0/1)	Online Ads	Standard ANN
Image	Object (1,...,1000)	photo tagging	Convolutional NNs
Audio	Text transcript	Speech recog.	Sequence data → RNNs
English	Chinese	Machine translation	Sequence data → RNNs
Image, Radar info	Position of other cars	Autonomous driving	Custom / complex / Hybrid NN

Neural Network examples



Standard NN | Convolutional NN



Recurrent NN

Supervised Learning

Structured Data

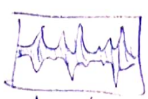
Housing

size	#bedrooms	price
:	:	:

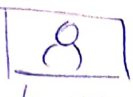
Online ad

age	Add id	Click
:	:	0 1 0 1

Unstructured Data



Audio



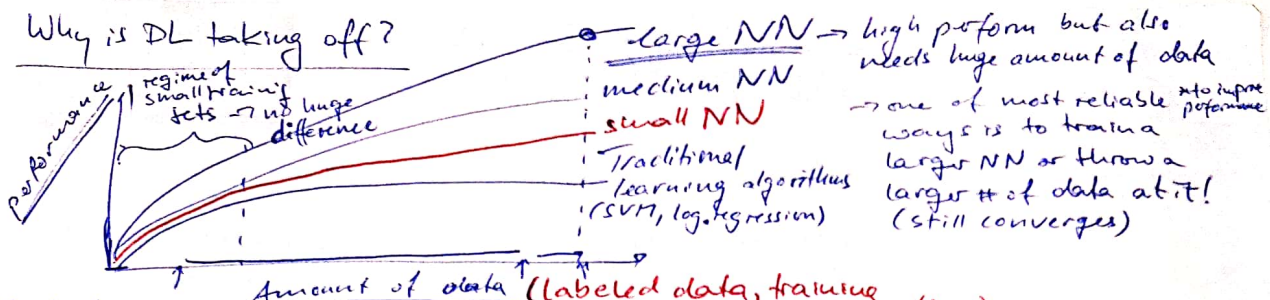
Image

"Hello"

Text

Humans are good at interpreting this

Why is DL taking off?



Scale drives DL progress

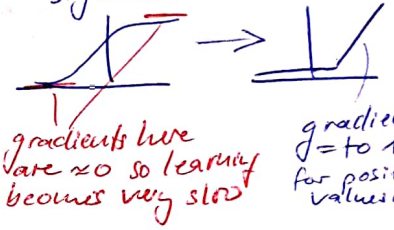
↳ Data (we have more and more now)

↳ activities on PC

↳ # → m

↳ • Data
• Computation (GPUs...)
• Algorithms → example:
↳ run NN much faster

huge breakthroughs in NN was switching from sigmoid to ReLU (activation functions)



made GD much faster!

gradients have slope ≈ 0 so learning becomes very slow

gradient = to 1 for positive values of input

1. Idea
2. Code
3. Experiment

→ the longer a NN needs to be trained the longer the circle takes (time)