

Copyright Notice

These slides are distributed under the Creative Commons License.

[DeepLearning.AI](#) makes these slides available for educational purposes. You may not use or distribute these slides for commercial purposes. You may make copies of these slides and use or distribute them for educational purposes as long as you cite [DeepLearning.AI](#) as the source of the slides.

For the rest of the details of the license, see <https://creativecommons.org/licenses/by-sa/2.0/legalcode>



deeplearning.ai

Introduction to Deep Learning

Welcome



- AI is **the new** Electricity
- Electricity had once transformed countless industries: transportation, manufacturing, healthcare, communications, and more
- AI will now bring about an equally big transformation.

What you'll learn



Courses in this sequence (Specialization):

1. Neural Networks and Deep Learning
2. Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
3. Structuring your Machine Learning project
4. Convolutional Neural Networks *CNN*
5. Natural Language Processing: Building sequence models
RNN, LSTM

train / dev / test
end-to-end

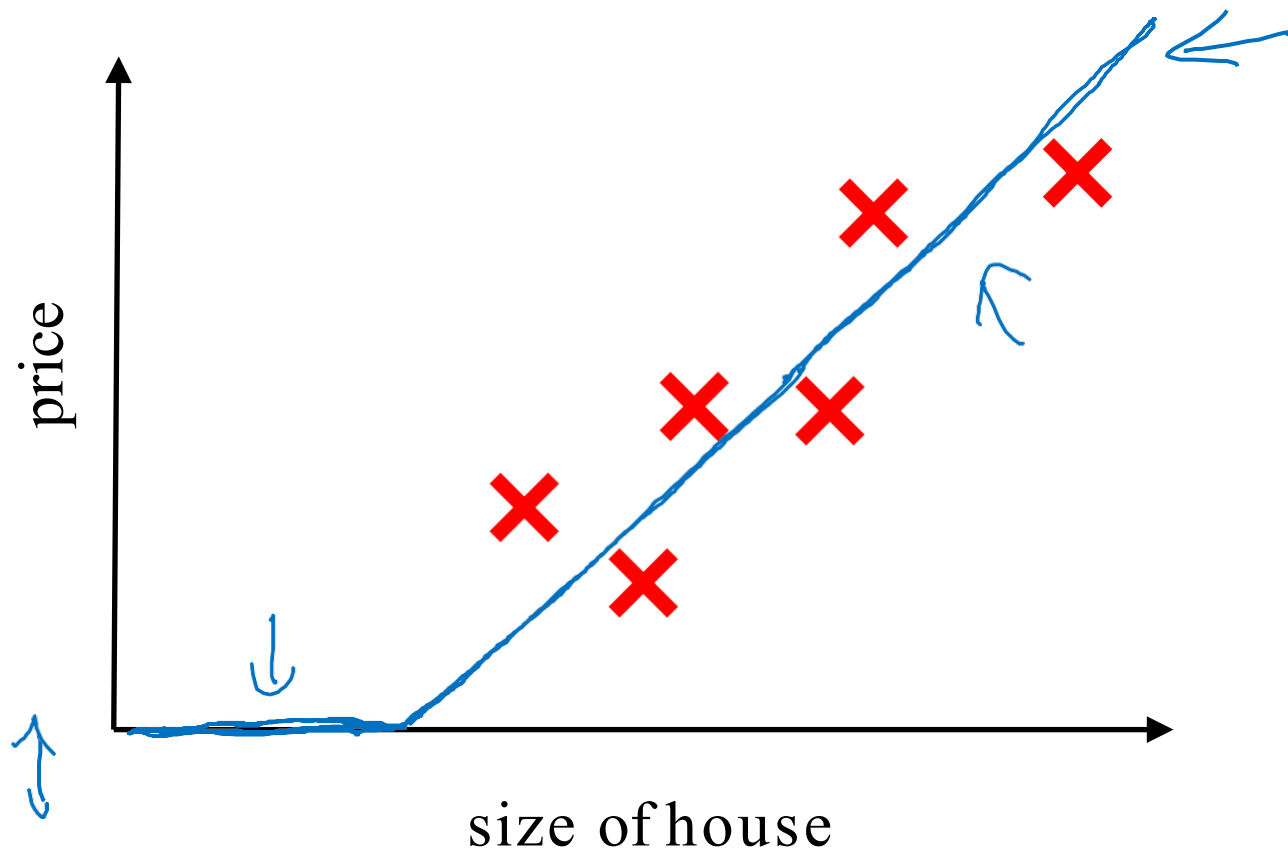


deeplearning.ai

Introduction to Deep Learning

What is a Neural Network?

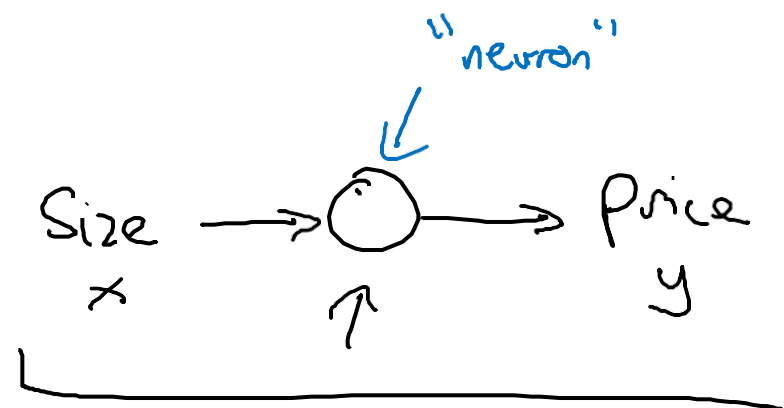
Housing Price Prediction



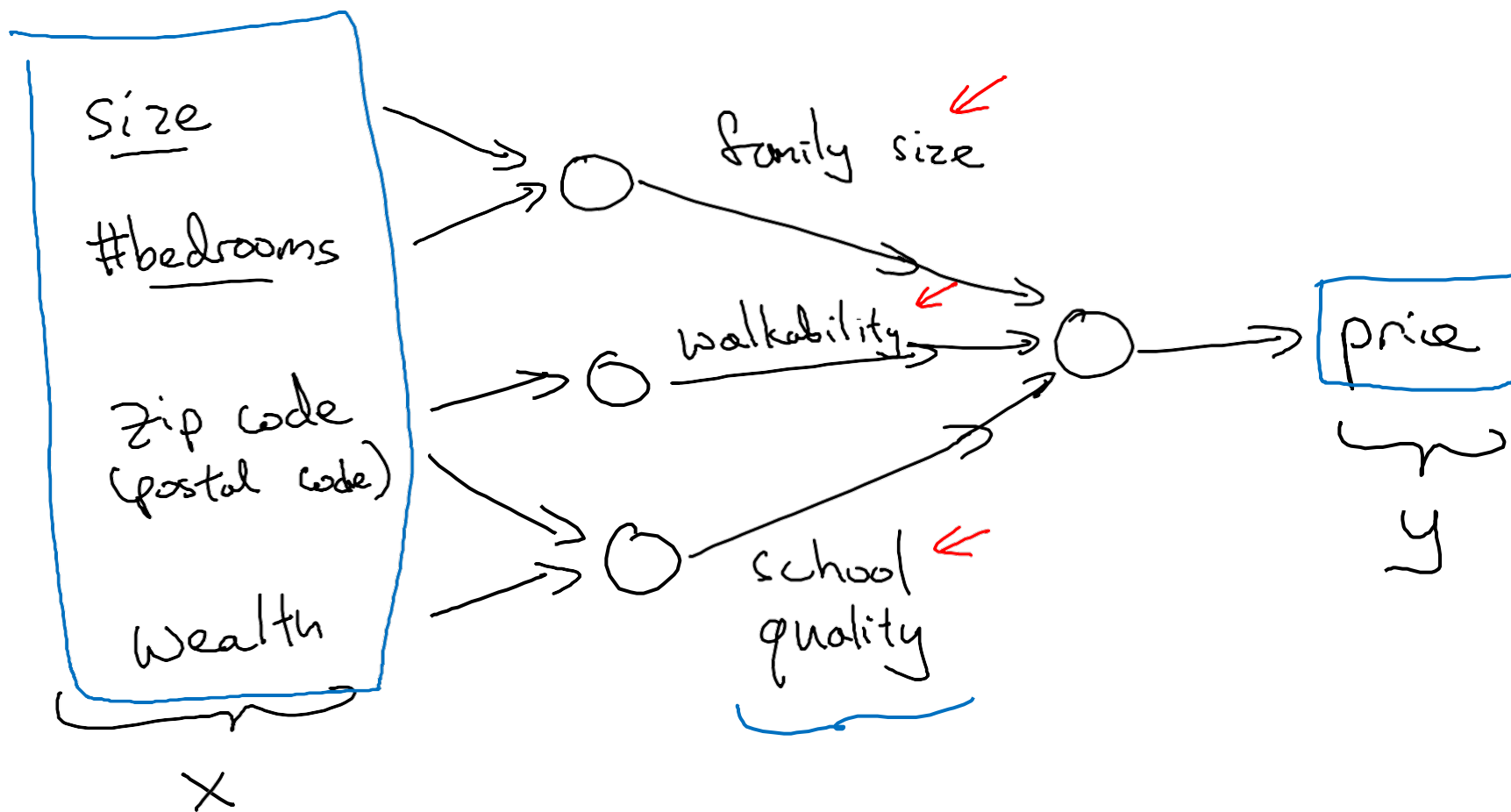
ReLU
Rectified
Linear
Unit



A small graph showing the ReLU function, which is zero for negative inputs and increases linearly for positive inputs. A blue arrow points to the linear part of the graph.

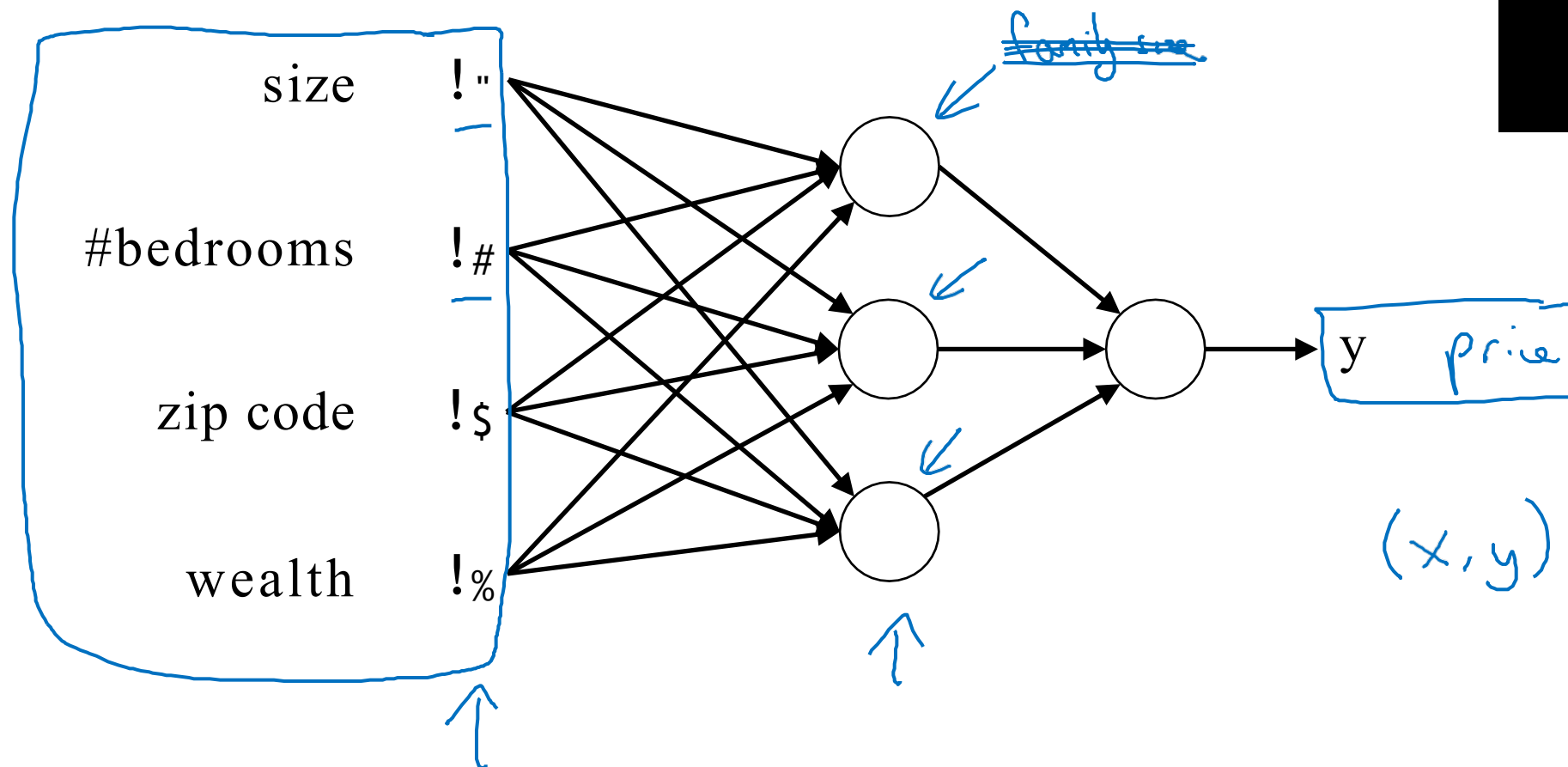


Housing Price Prediction



Housing Price Prediction

**Drawing of
previous Image**









deeplearning.ai

Introduction to Deep Learning

Supervised Learning with Neural Networks

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
<u>English</u>	Chinese	Machine translation
<u>Image</u> , <u>Radar info</u>	Position of other cars 	Autonomous driving

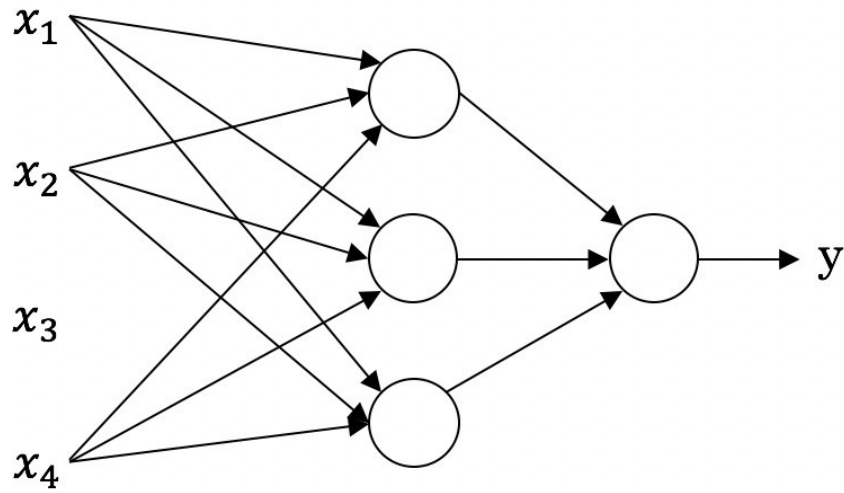
} Standard NN

} CNN

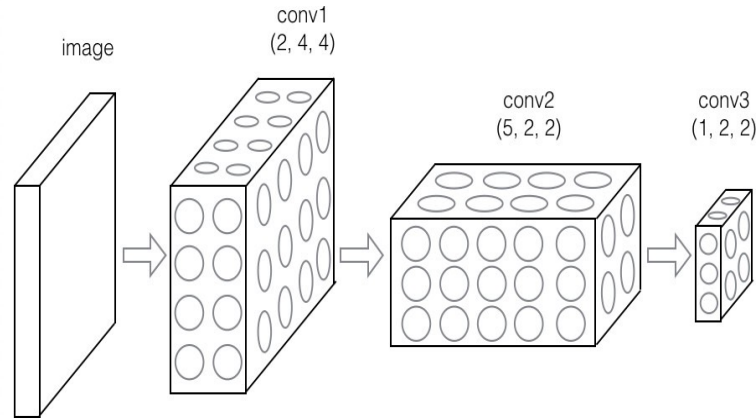
} RNN

} Custom/ Hybrid

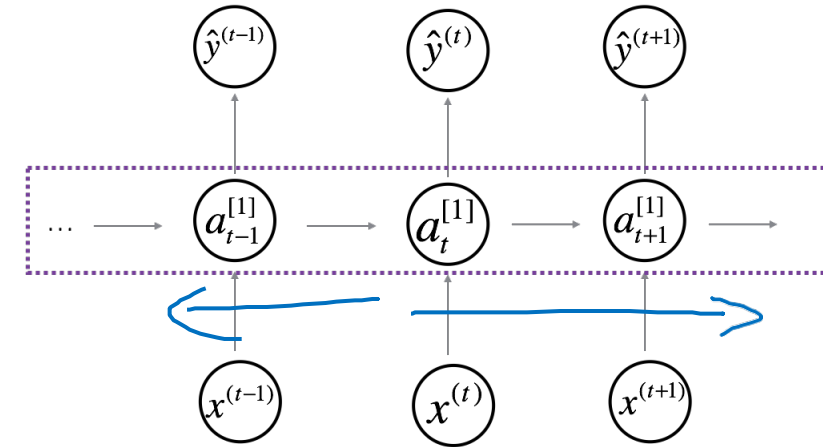
Neural Network examples



Standard NN



Convolutional NN



Recurrent NN

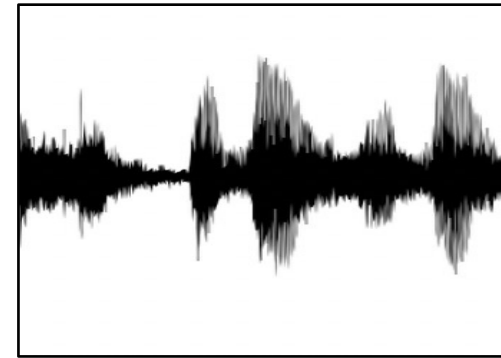
Supervised Learning

Structured Data

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

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

Unstructured Data



Audio



Image

Four scores and seven
years ago...

Text

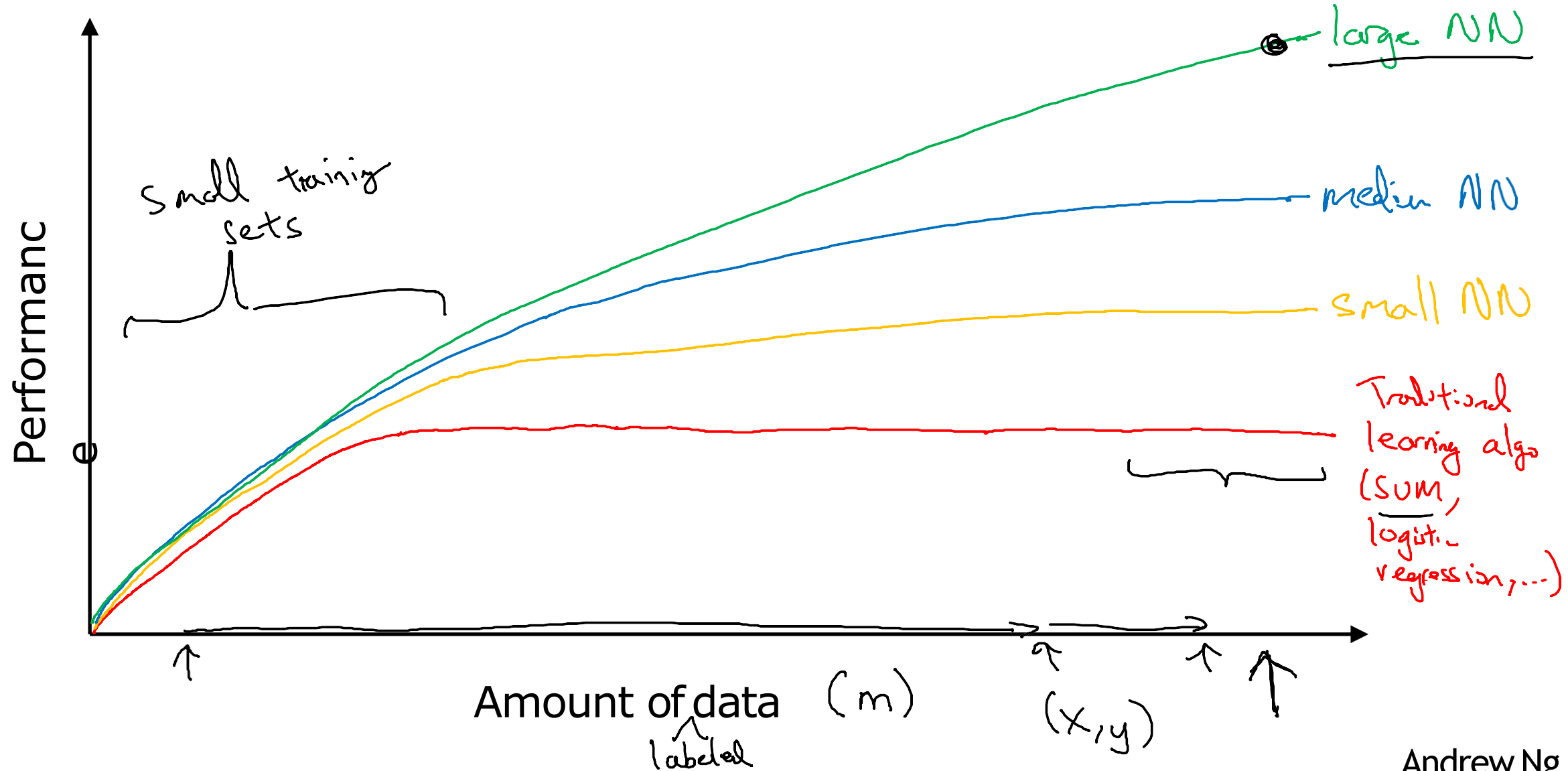


deeplearning.ai

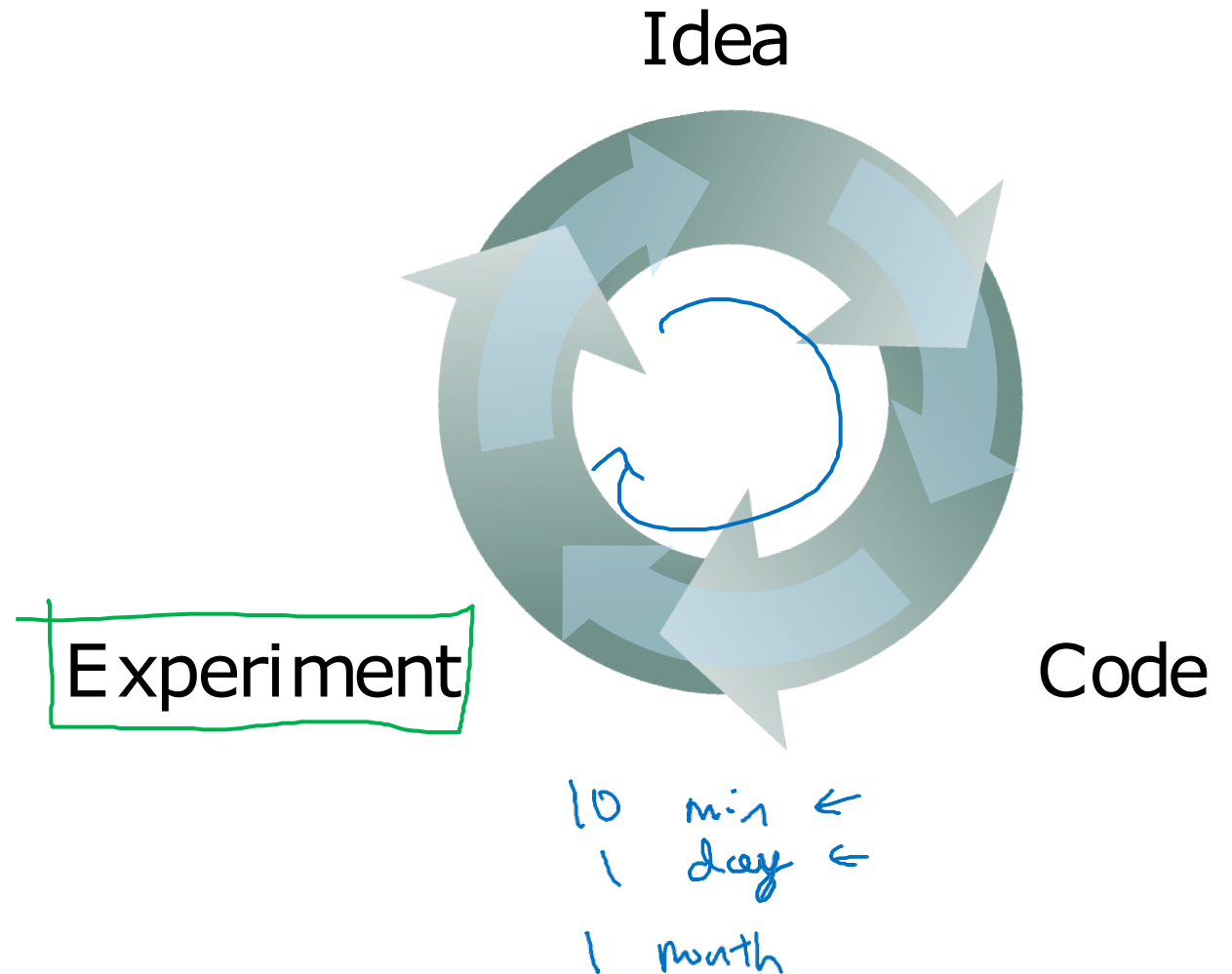
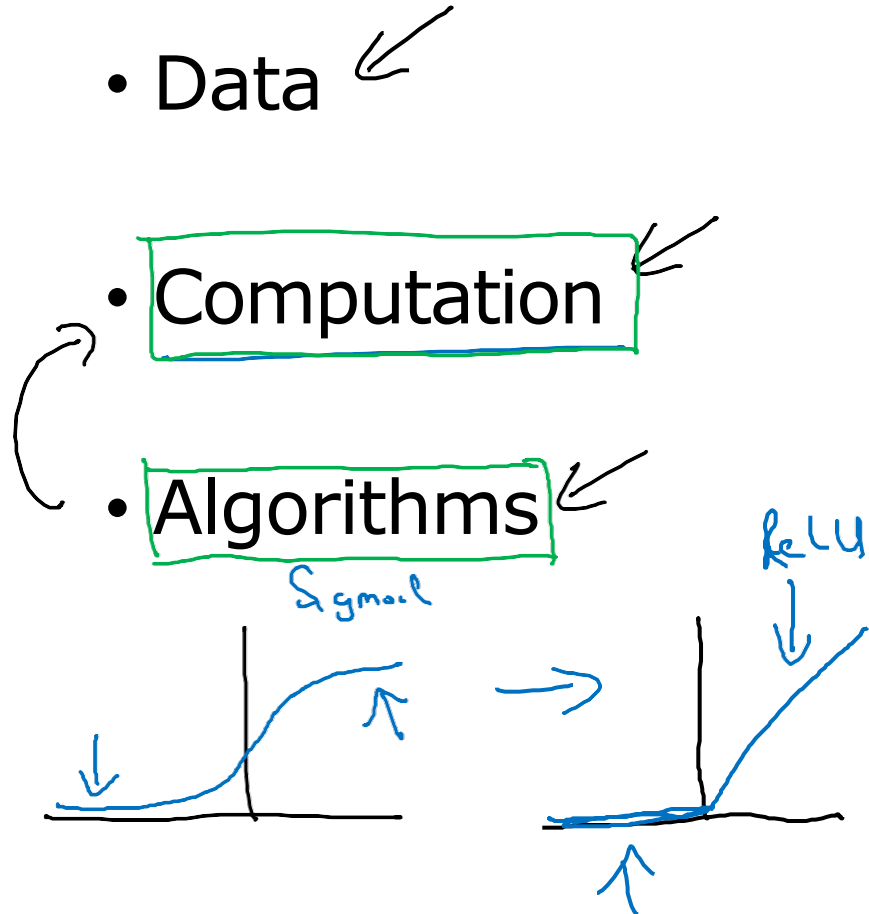
Introduction to Neural Networks

Why is Deep Learning taking off?

Scale drives deep learning progress



Scale drives deep learning progress






deeplearning.ai

Introduction to Neural Networks

About this Course

Courses in this Specialization

1. Neural Networks and Deep Learning 
2. Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
3. Structuring your Machine Learning project
4. Convolutional Neural Networks
5. Natural Language Processing: Building sequence models

Outline of this Course

Week 1: Introduction

Week 2: Basics of Neural Network programming

Week 3: One hidden layer Neural Networks

Week 4: Deep Neural Networks