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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

train / dev / test
end-to-end

RNN , LSTM

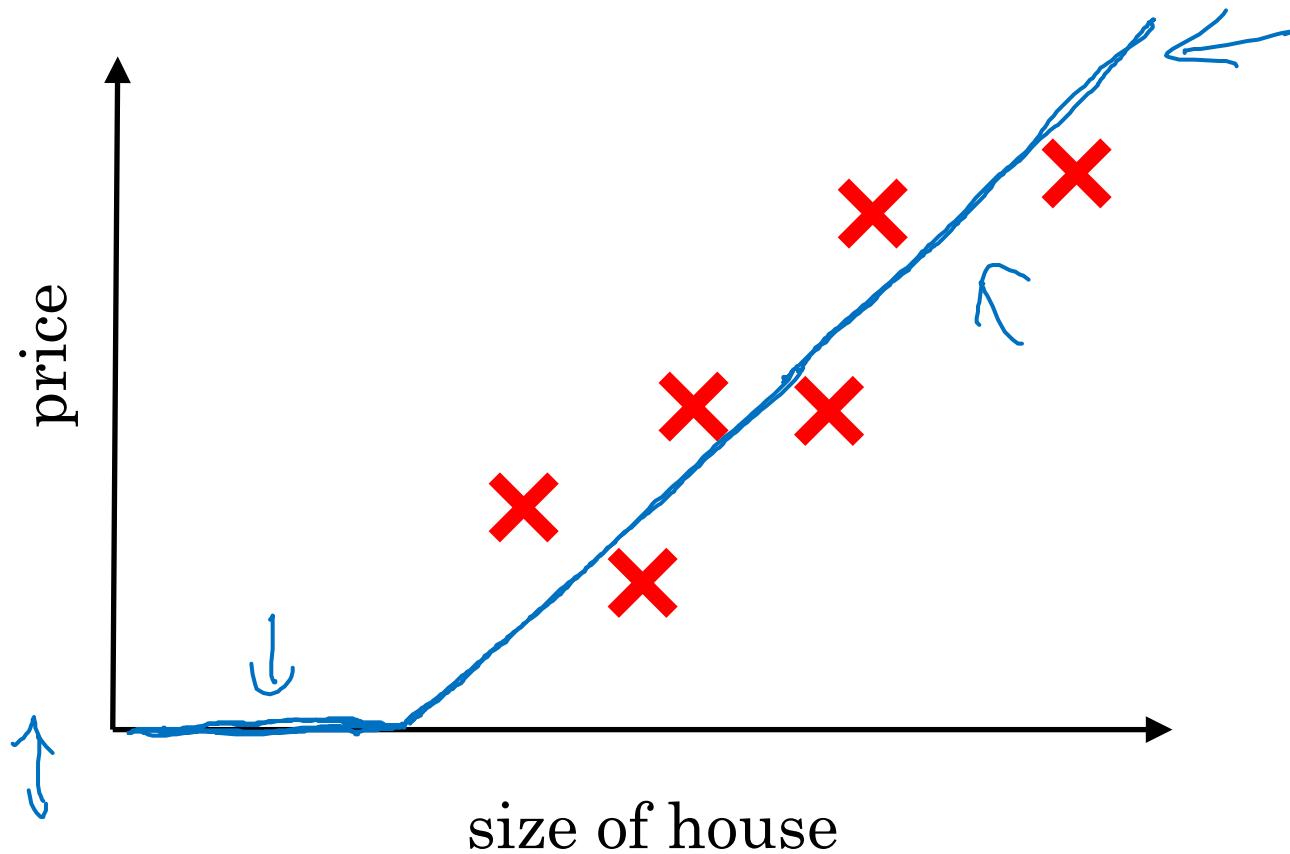


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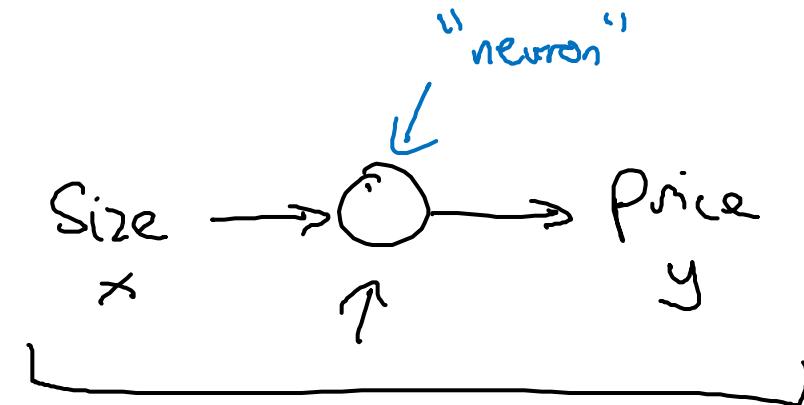
Introduction to Deep Learning

What is a Neural Network?

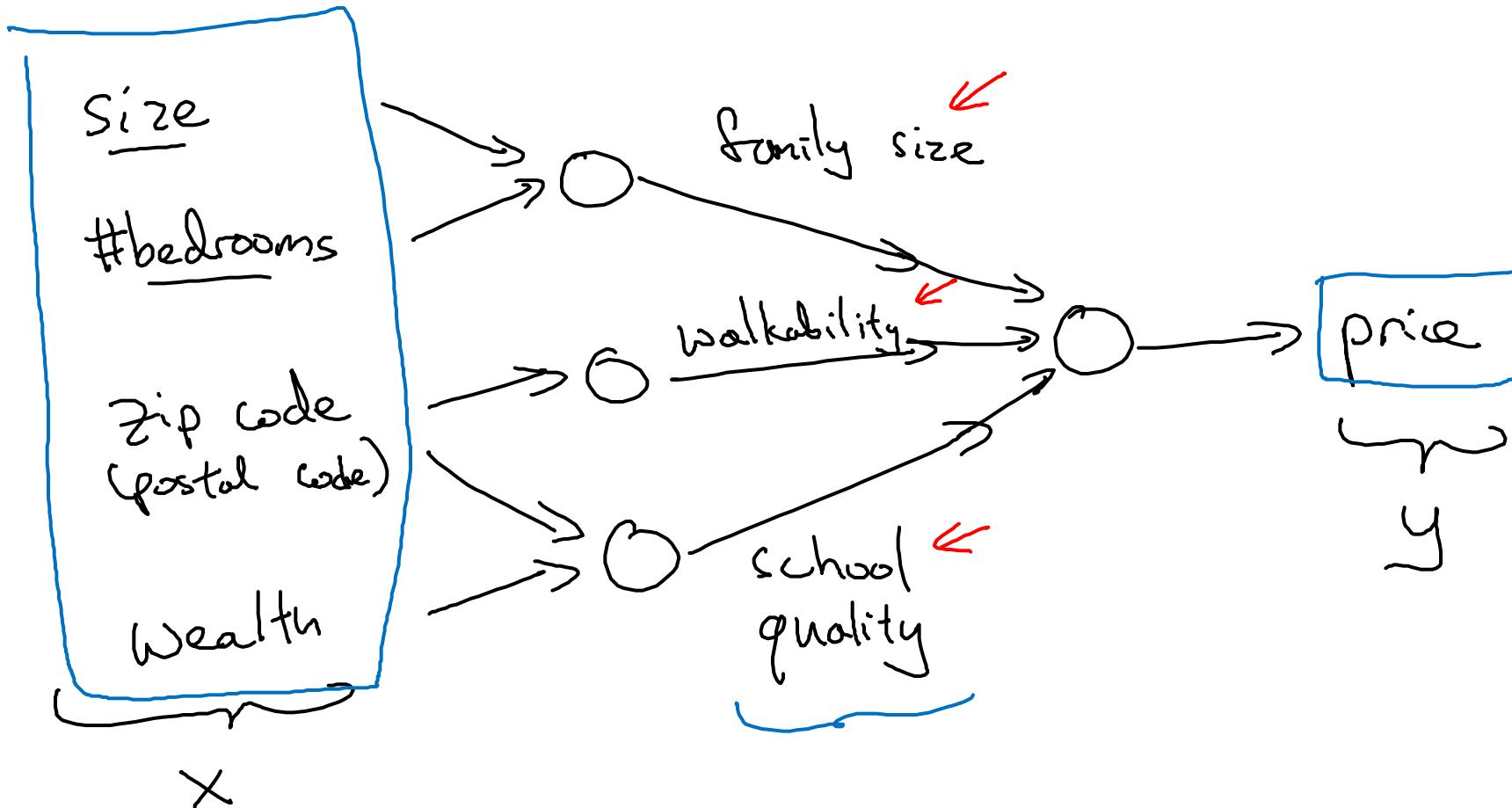
Housing Price Prediction



ReLU
Rectified
Linear
Unit

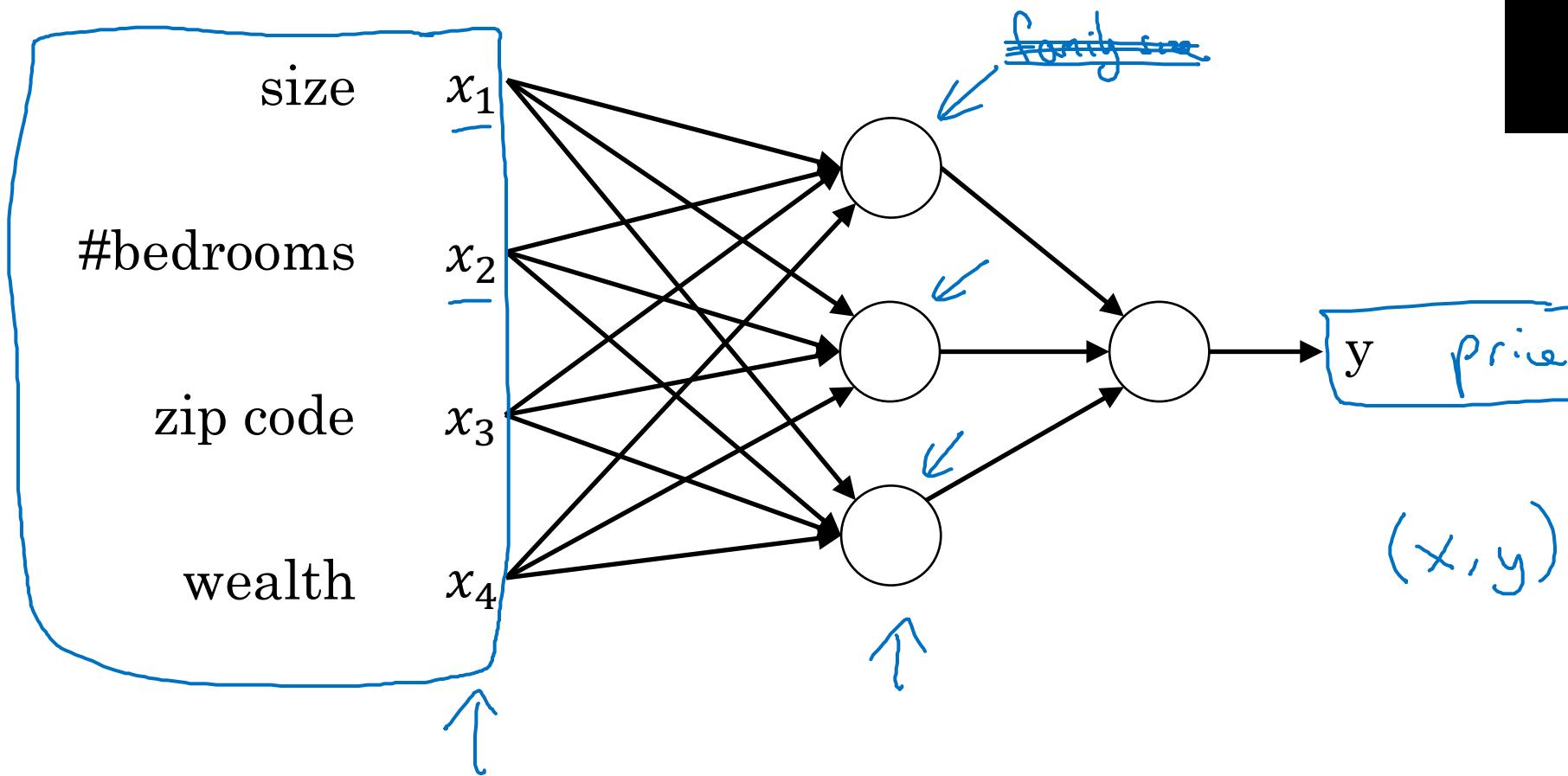


Housing Price Prediction



Housing Price Prediction

Drawing of
previous Image





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Introduction to Deep Learning

Supervised Learning with Neural Networks

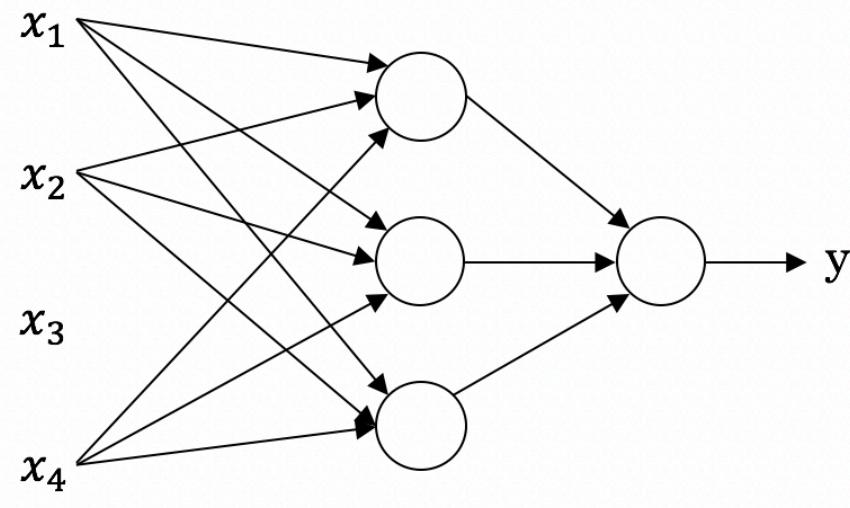
Supervised Learning

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, Radar info</u>	Position of other cars	Autonomous driving

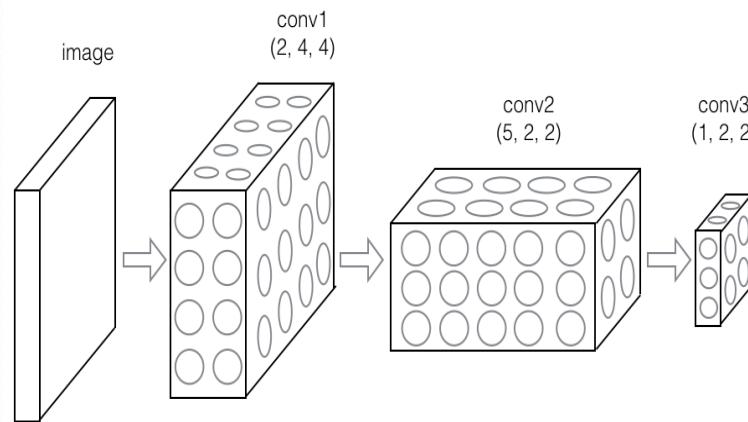
Annotations:

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- A blue arrow points from "Input(x)" to "Ad, user info".
- A blue arrow points from "Input(x)" to "Image".
- A blue arrow points from "Input(x)" to "Audio".
- A blue arrow points from "Input(x)" to "English".
- A blue arrow points from "Input(x)" to "Image, Radar info".
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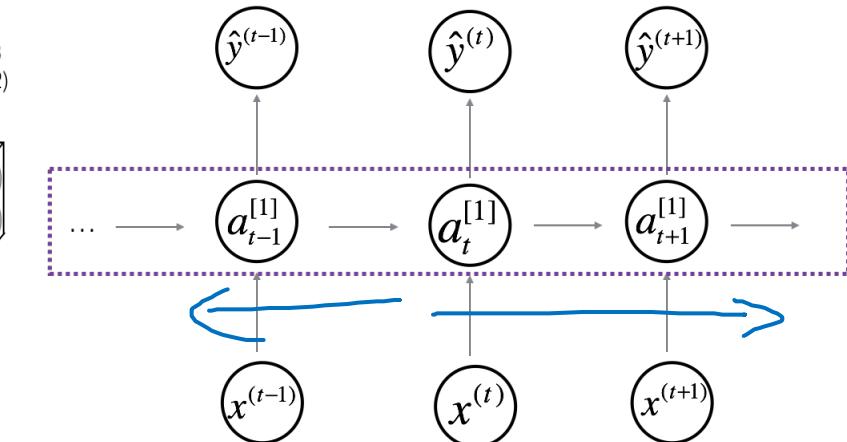
Neural Network examples



Standard NN



Convolutional NN



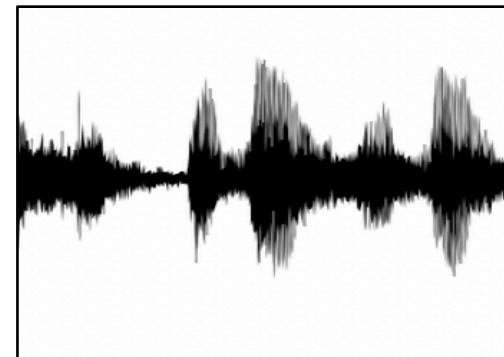
Recurrent NN

Supervised Learning

Structured Data

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

Unstructured Data



Audio

Image

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

Four scores and seven years ago...

Text



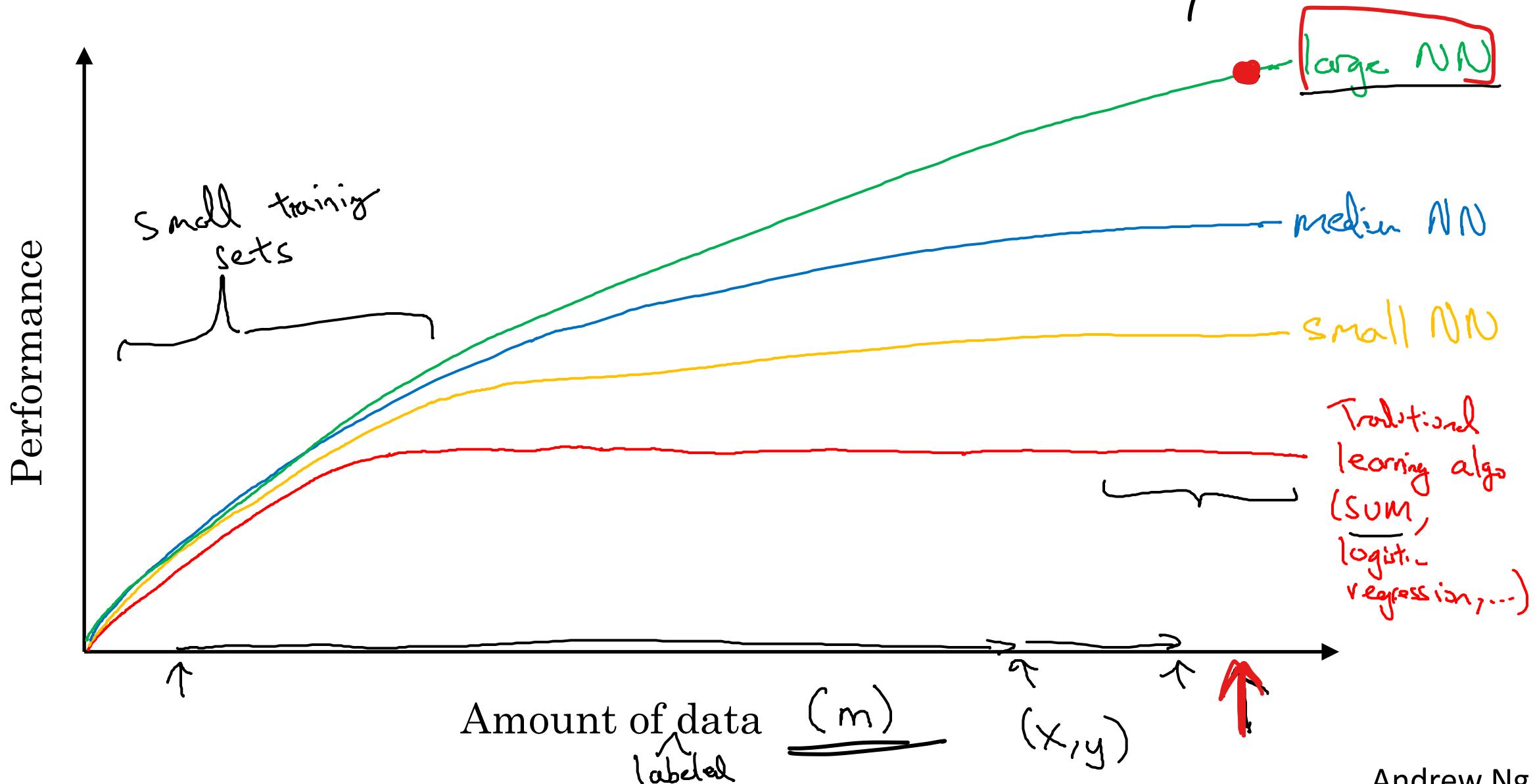
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Introduction to Neural Networks

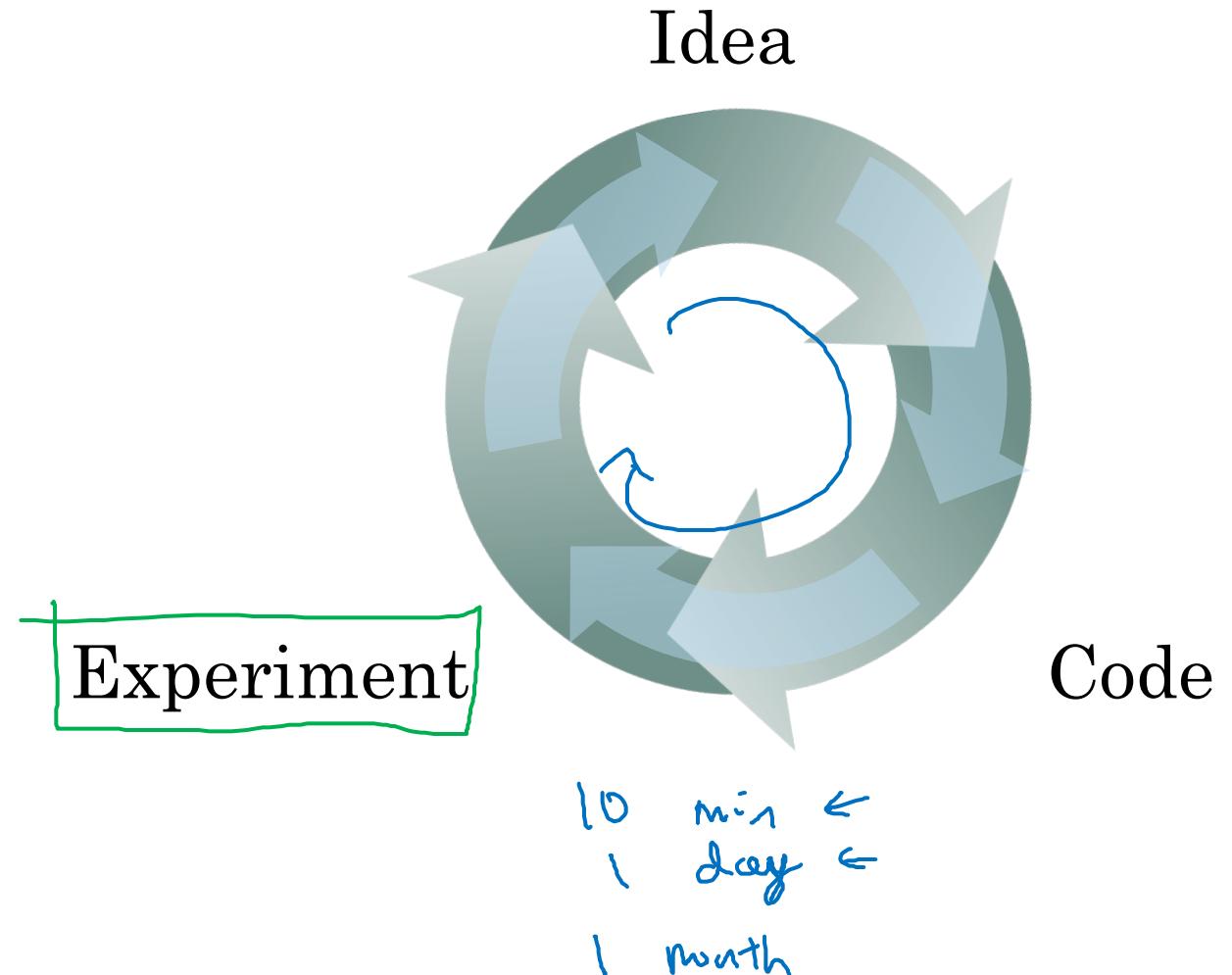
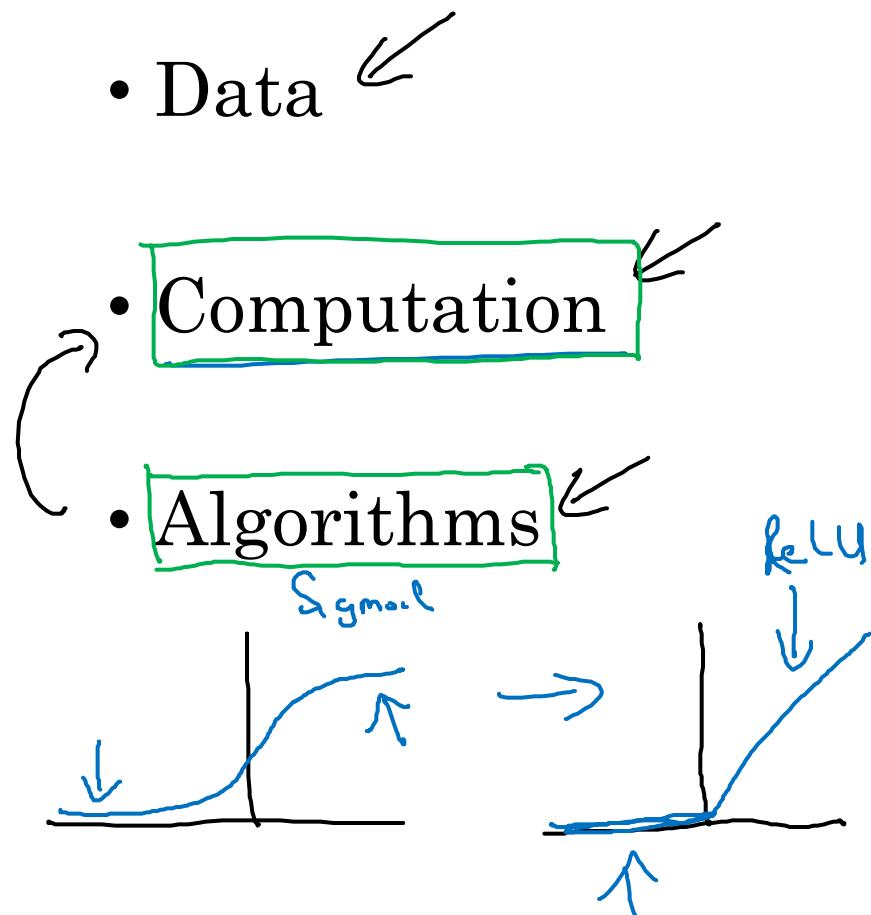
Why is Deep Learning taking off?

Scale drives deep learning progress

over here we
are able to get the
best perf



Scale drives deep learning progress





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Introduction to Neural Networks

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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



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Introduction to Deep Learning

Supervised Learning with Neural Networks

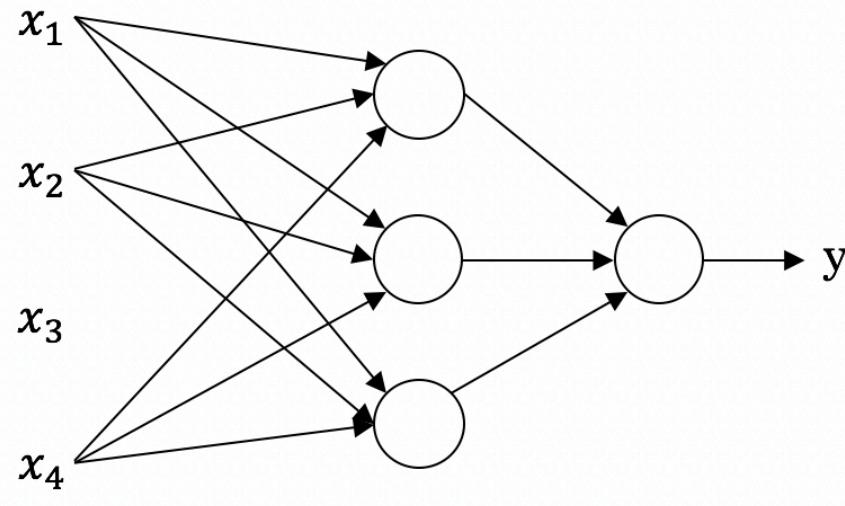
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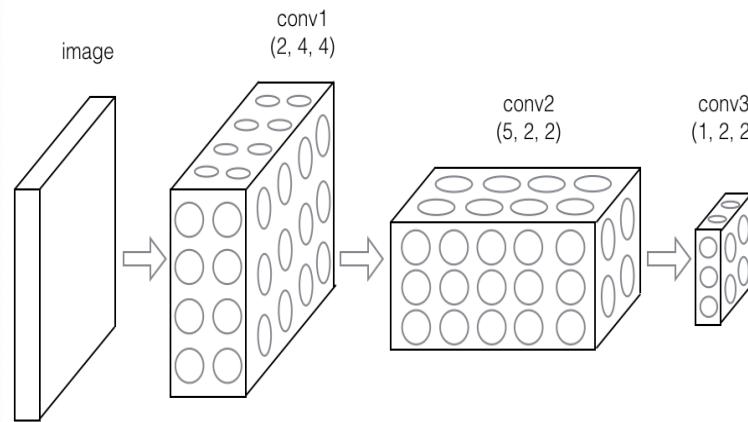
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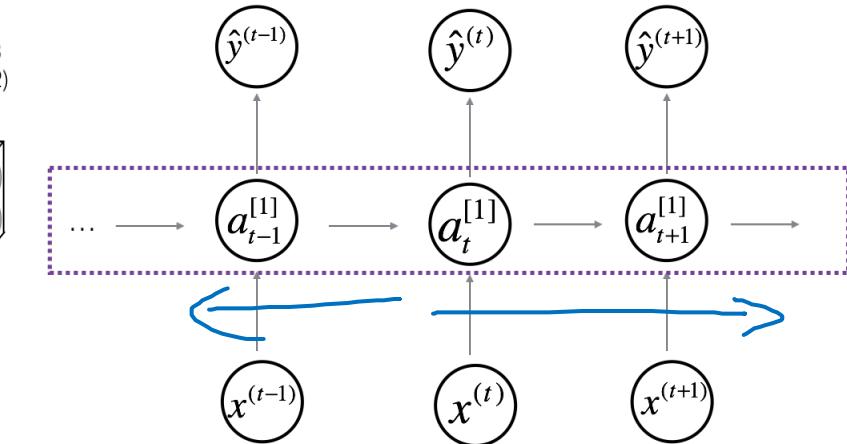
Neural Network examples



Standard NN



Convolutional NN



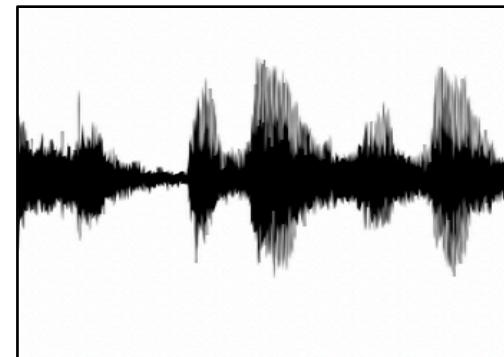
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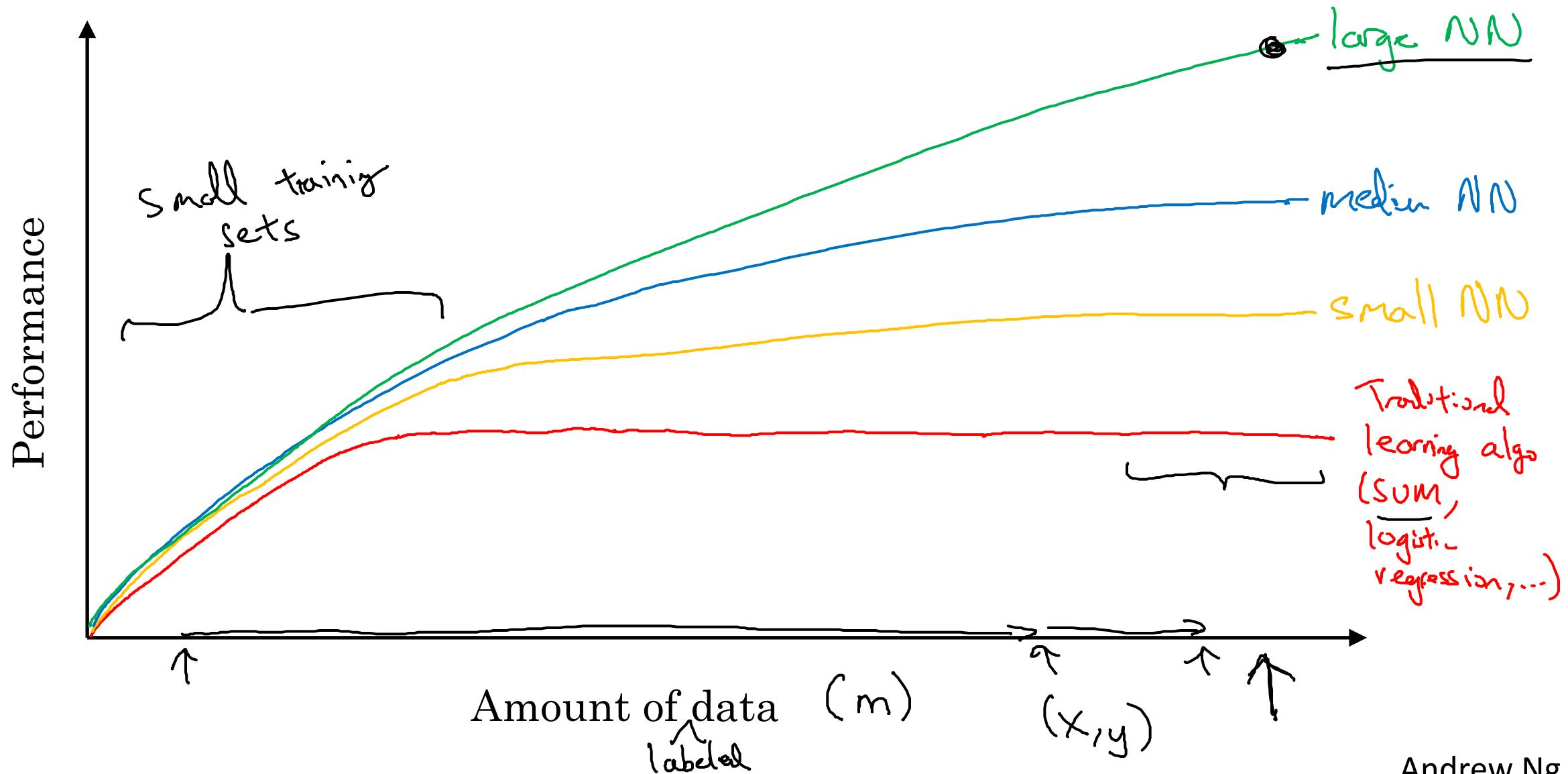


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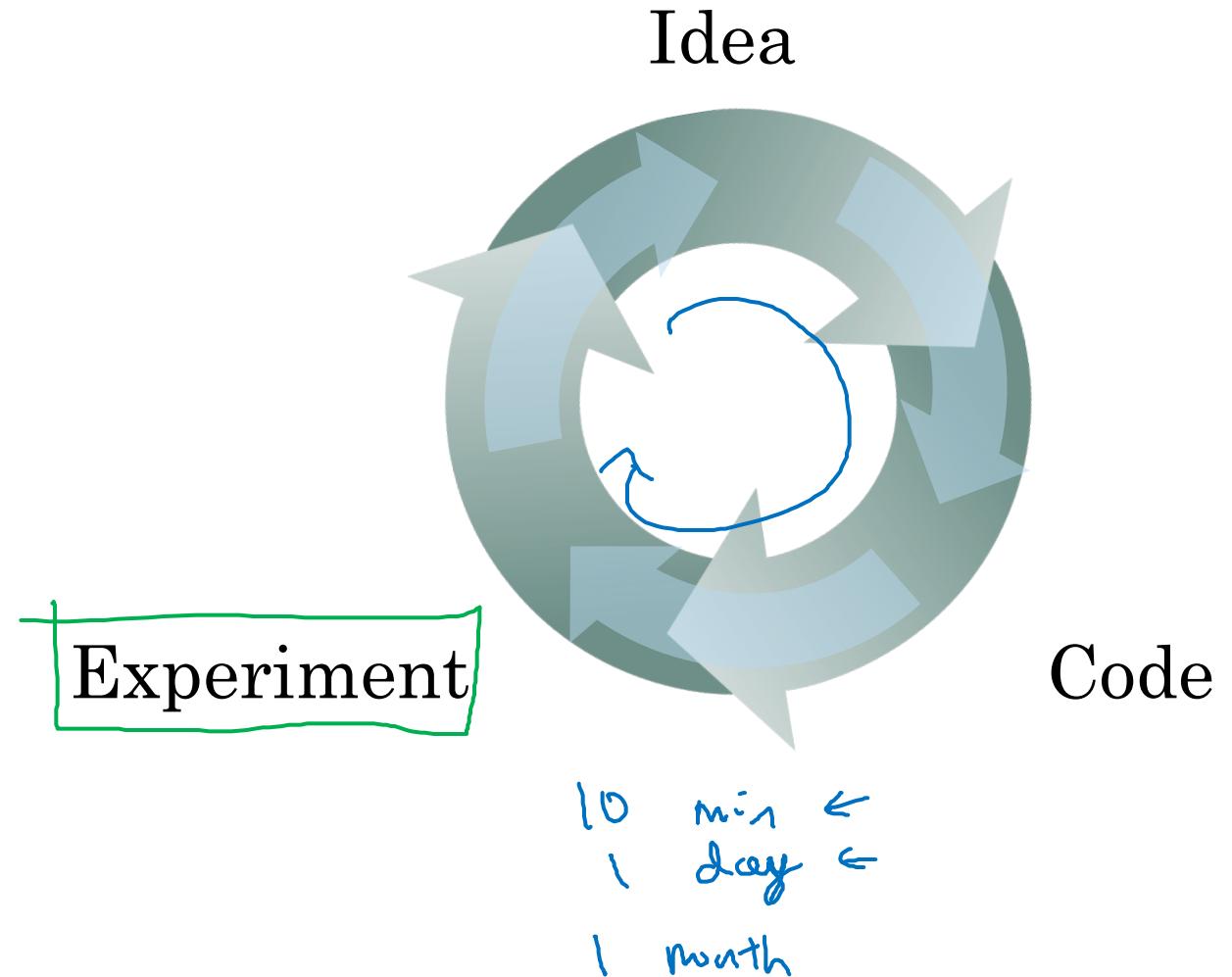
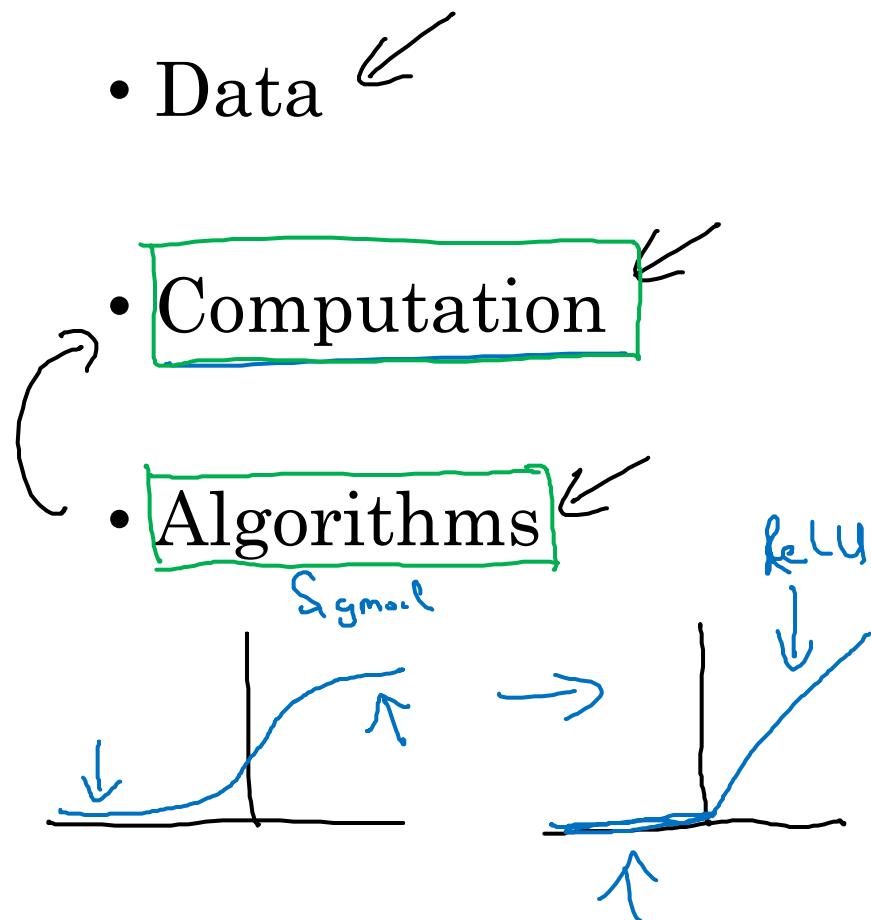
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