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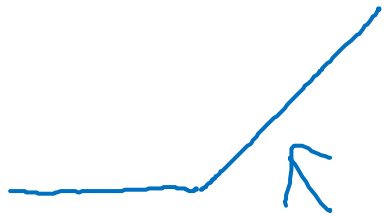
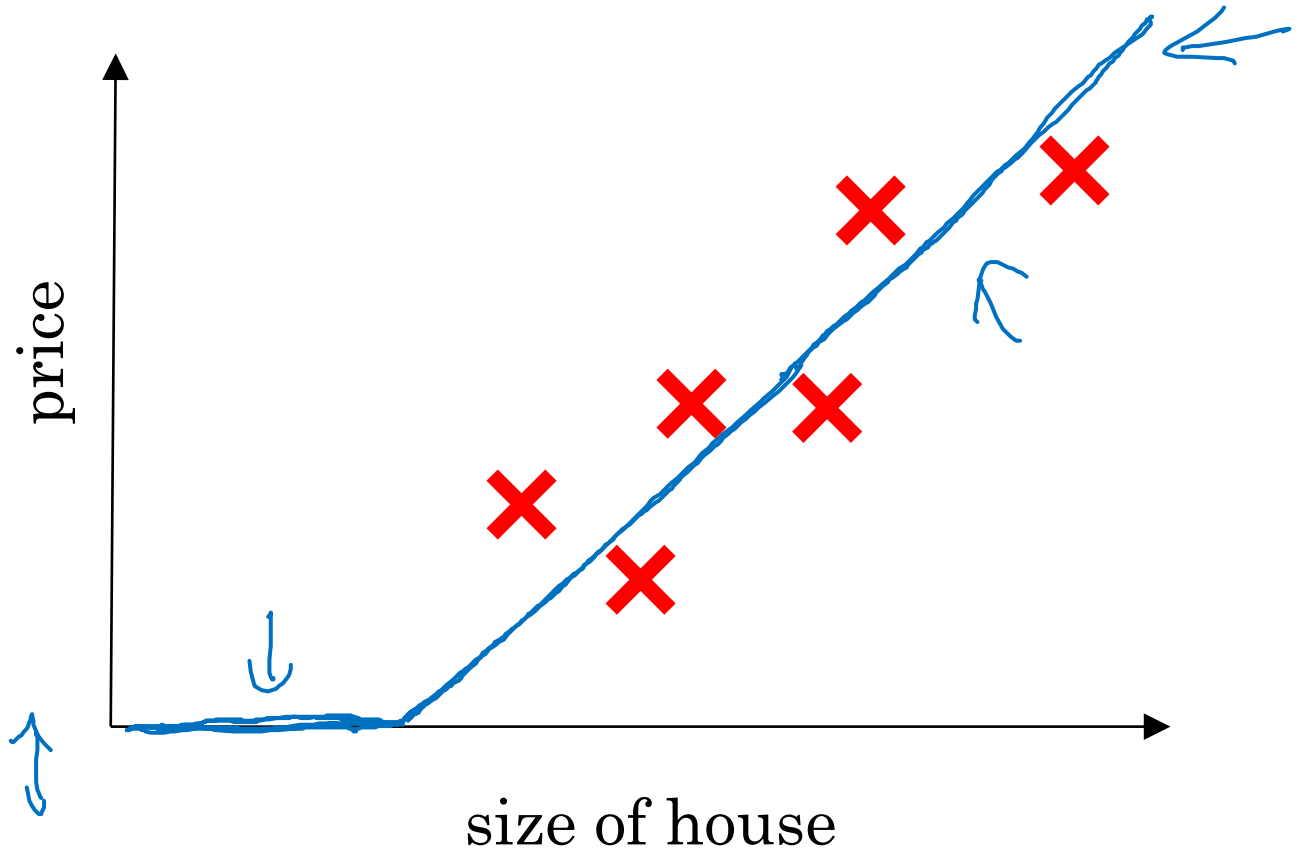
# Introduction to Deep Learning

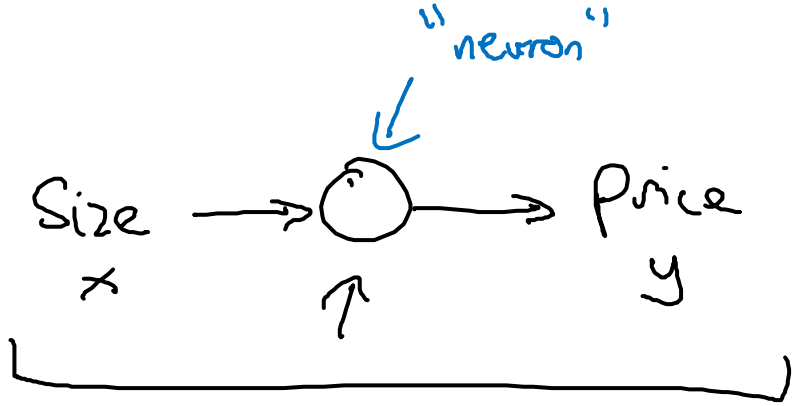
# What is a Neural Network?

# Housing Price Prediction

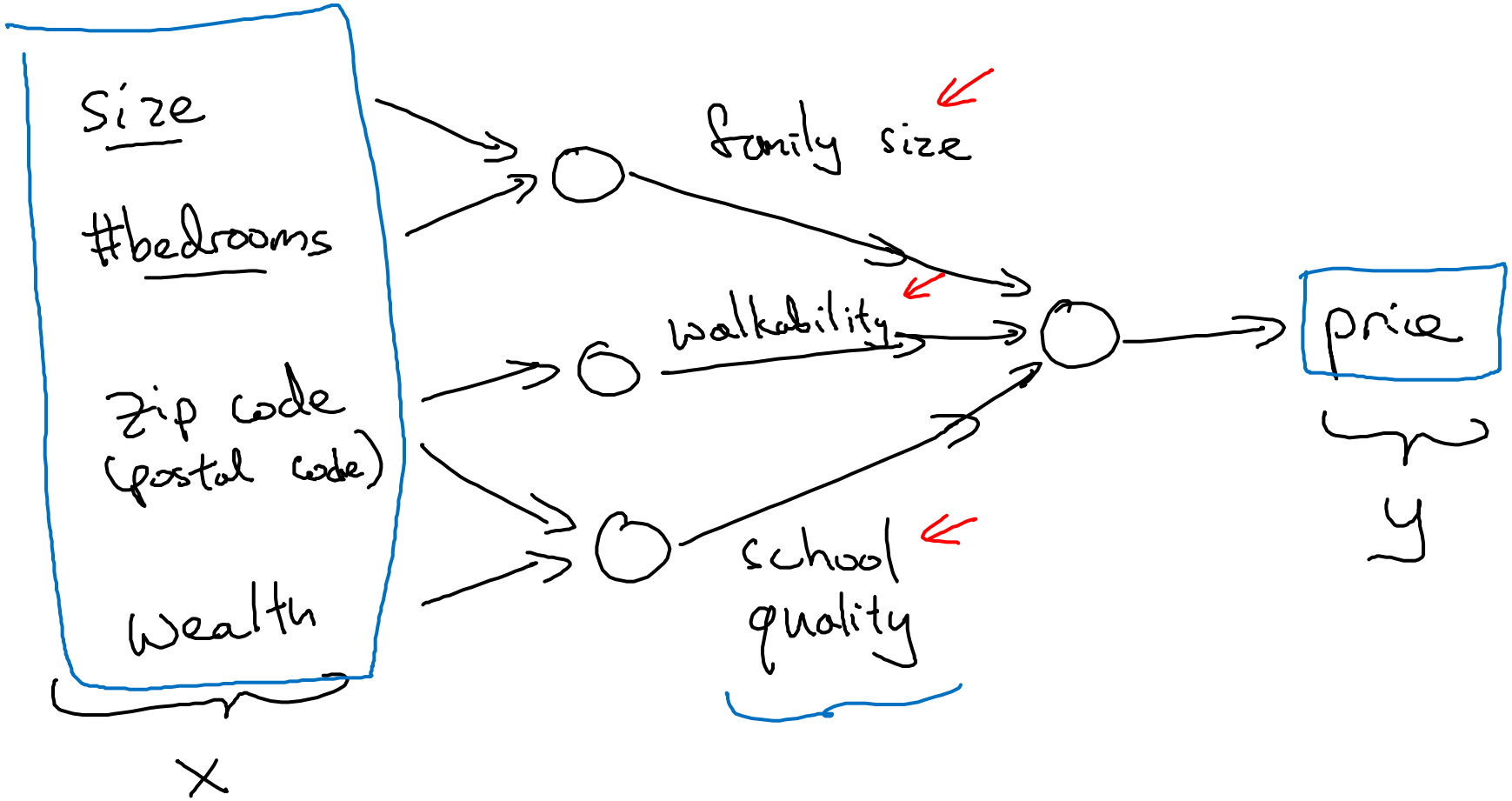


ReLU
Rectified
Linear
Unit



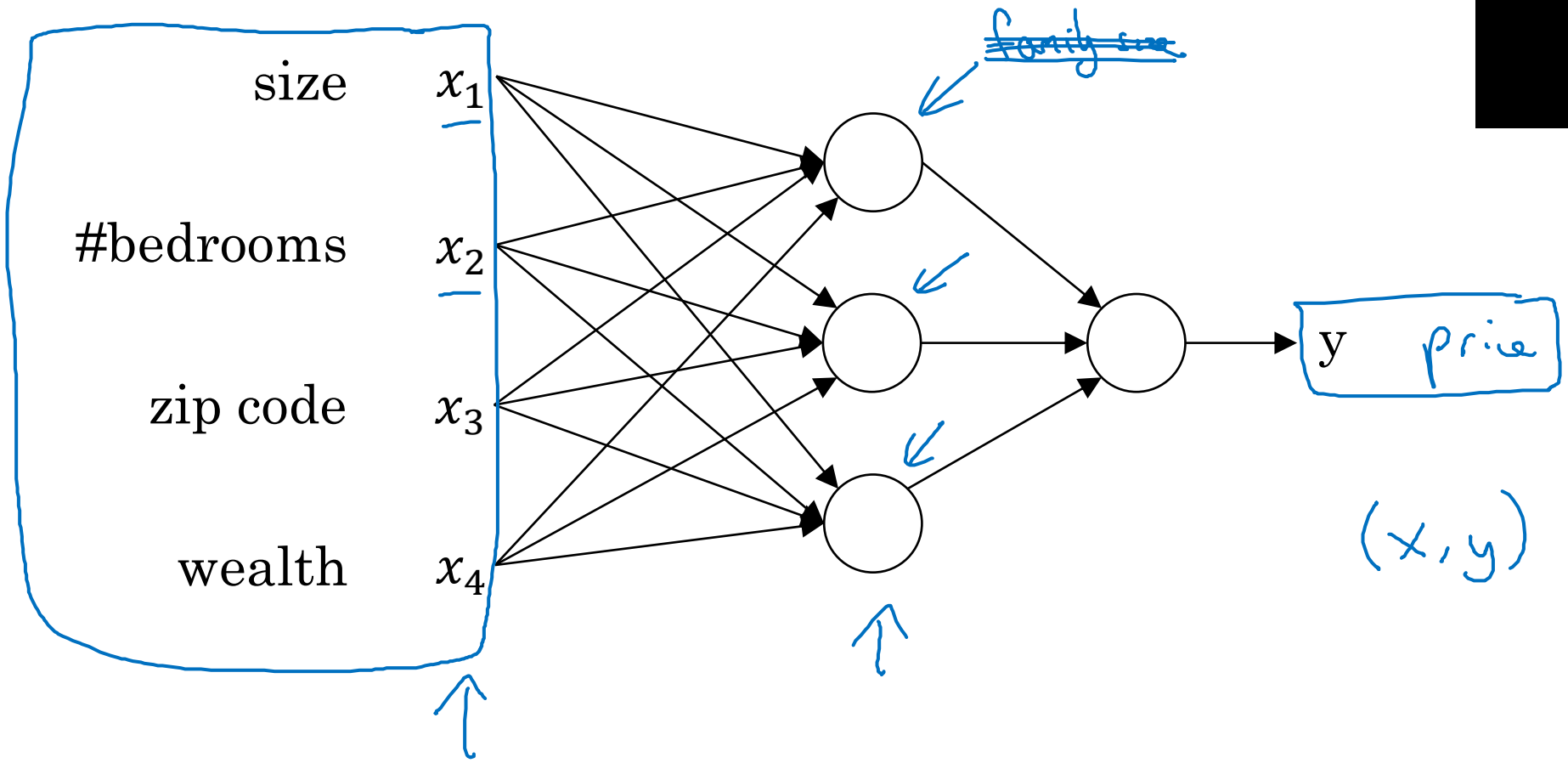



# Housing Price Prediction



# 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 |
| English | Chinese | Machine translation |
| Image, Radar info | Position of other cars | Autonomous driving |

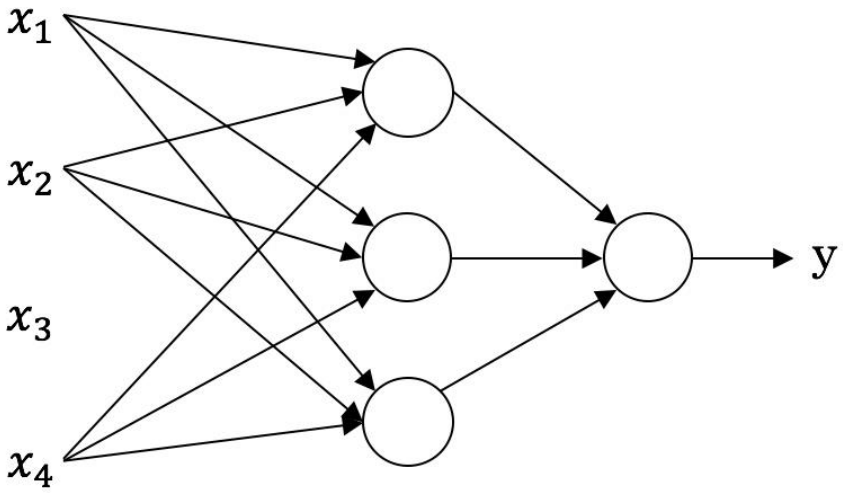
Standard NN

CNN

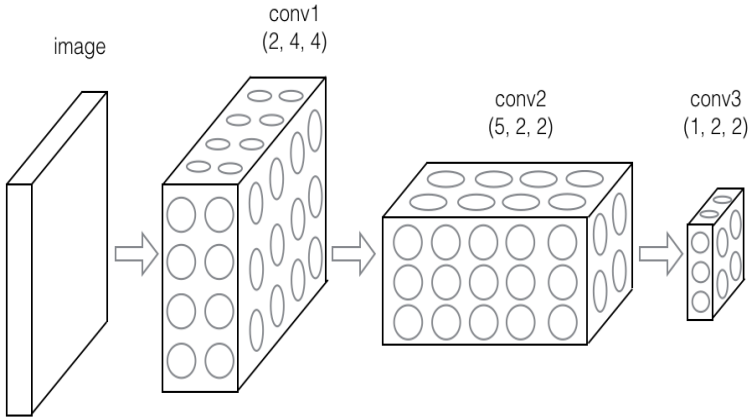
RNN

Custom/ Hybrid

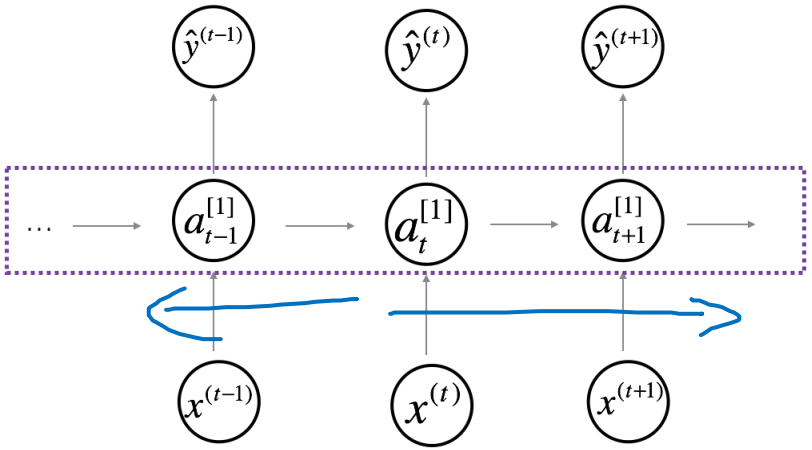
# Neural Network examples




Standard NN




Convolutional NN




Recurrent NN

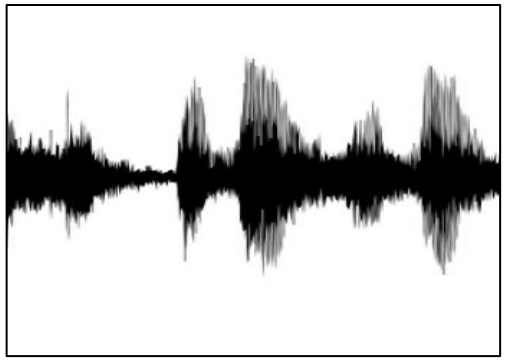
# Supervised Learning

## Structured Data

| Size | #bedrooms | ... | Price (1000$s) |
|---|---|---|---|
| 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

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# Introduction to Neural Networks

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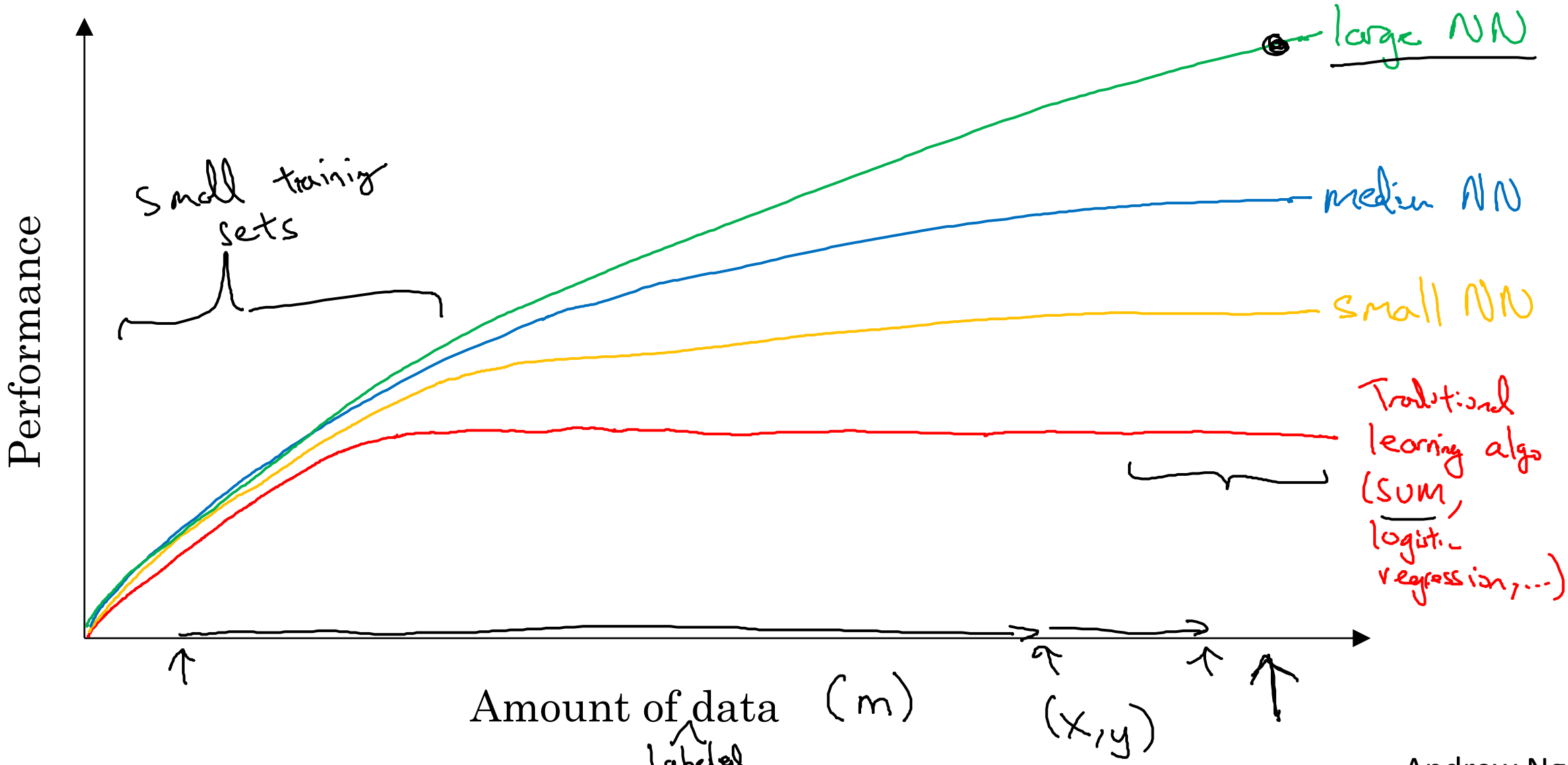
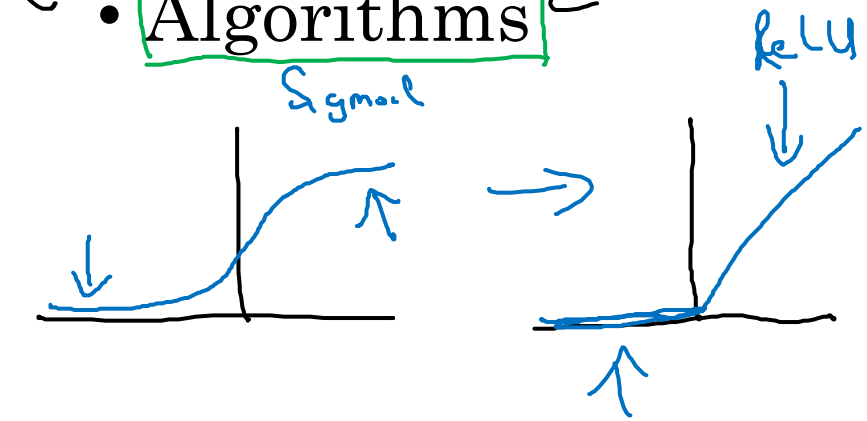
# Why is Deep Learning taking off?

# Scale drives deep learning progress

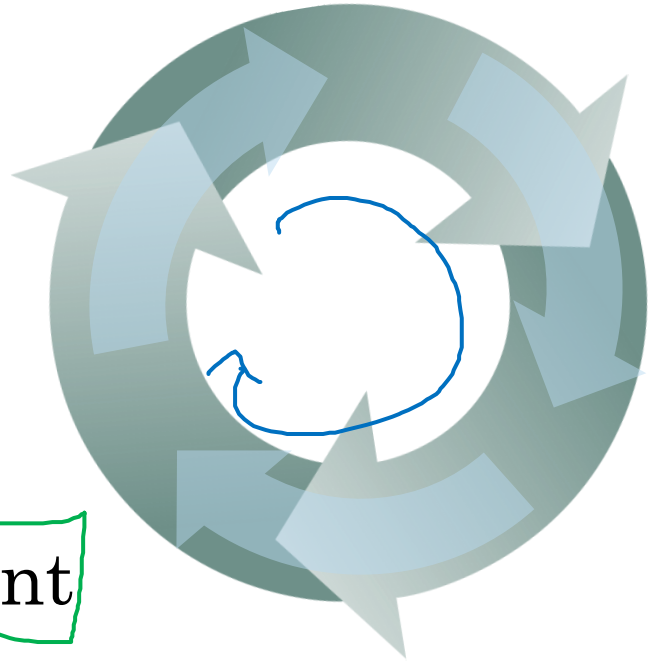


# Scale drives deep learning progress

- Data
- Computation
- Algorithms




Idea



Experiment

Code

10 min
1 day
1 month

Andrew Ng