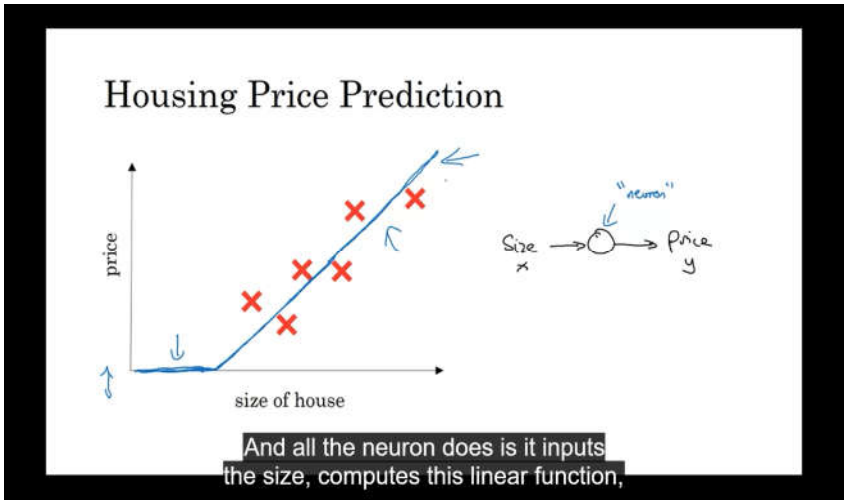
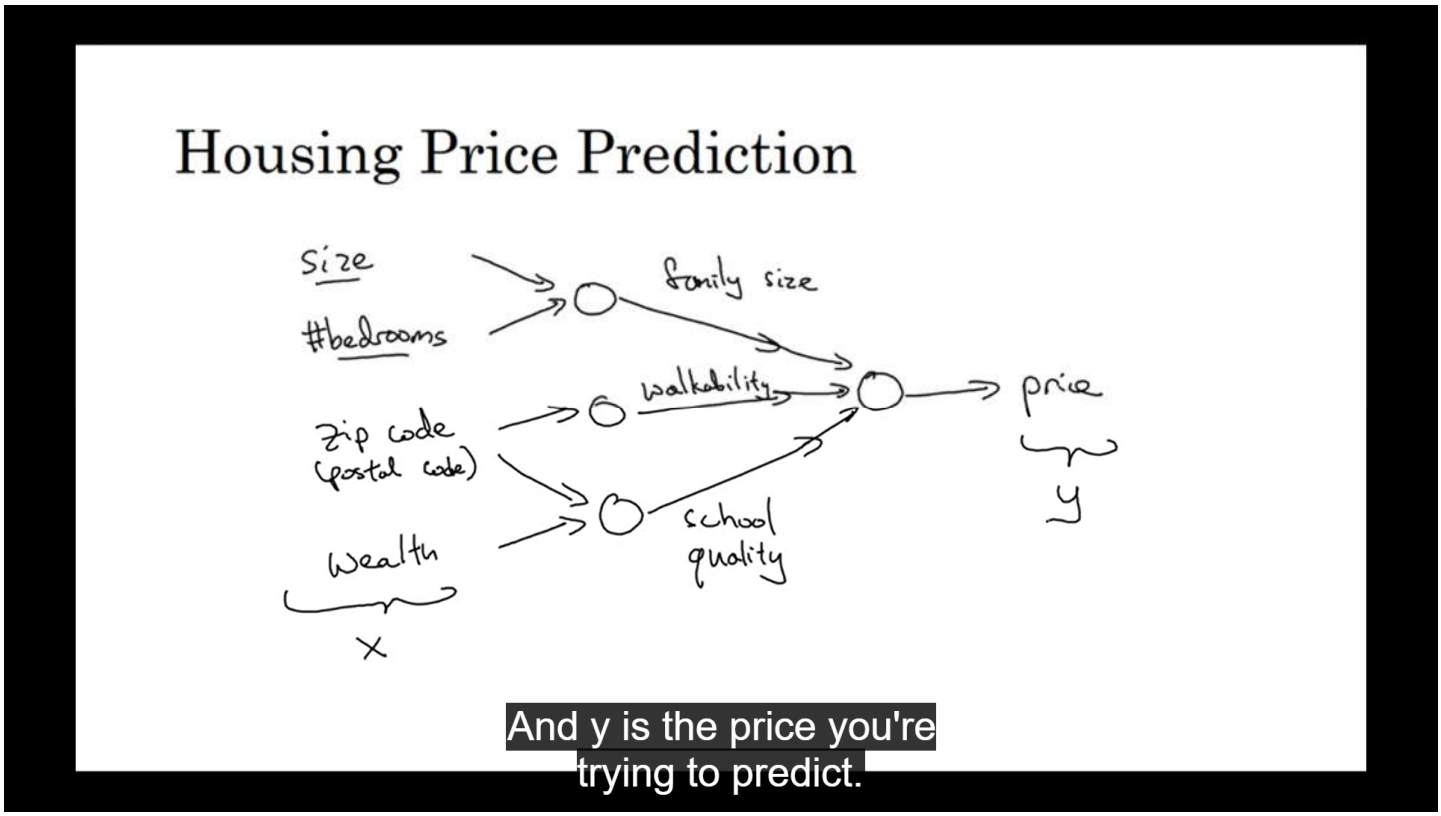
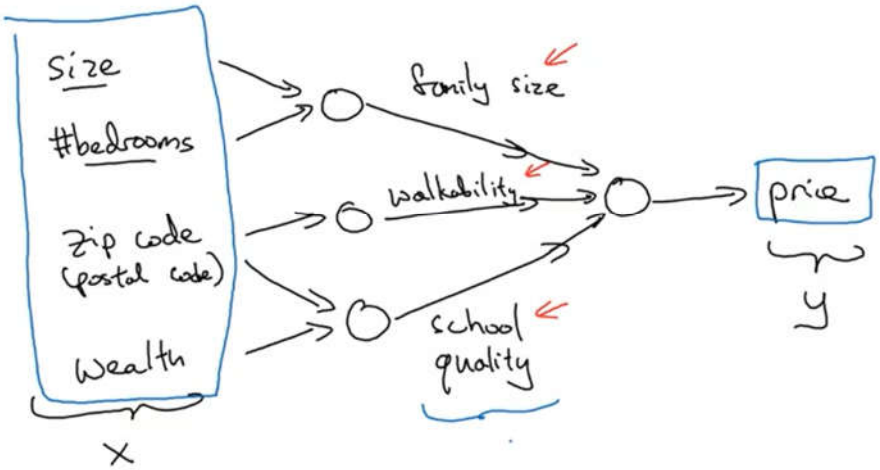
Week1

06 May 2020 18:43



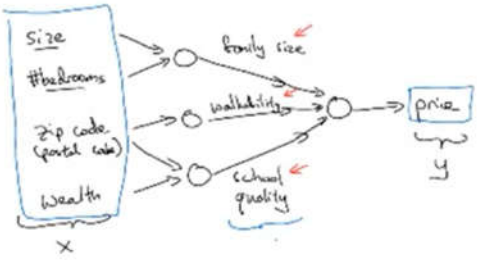



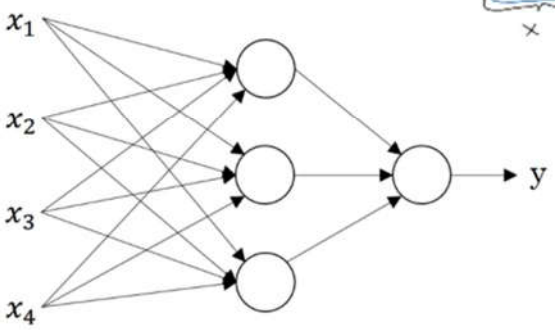
## Housing Price Prediction



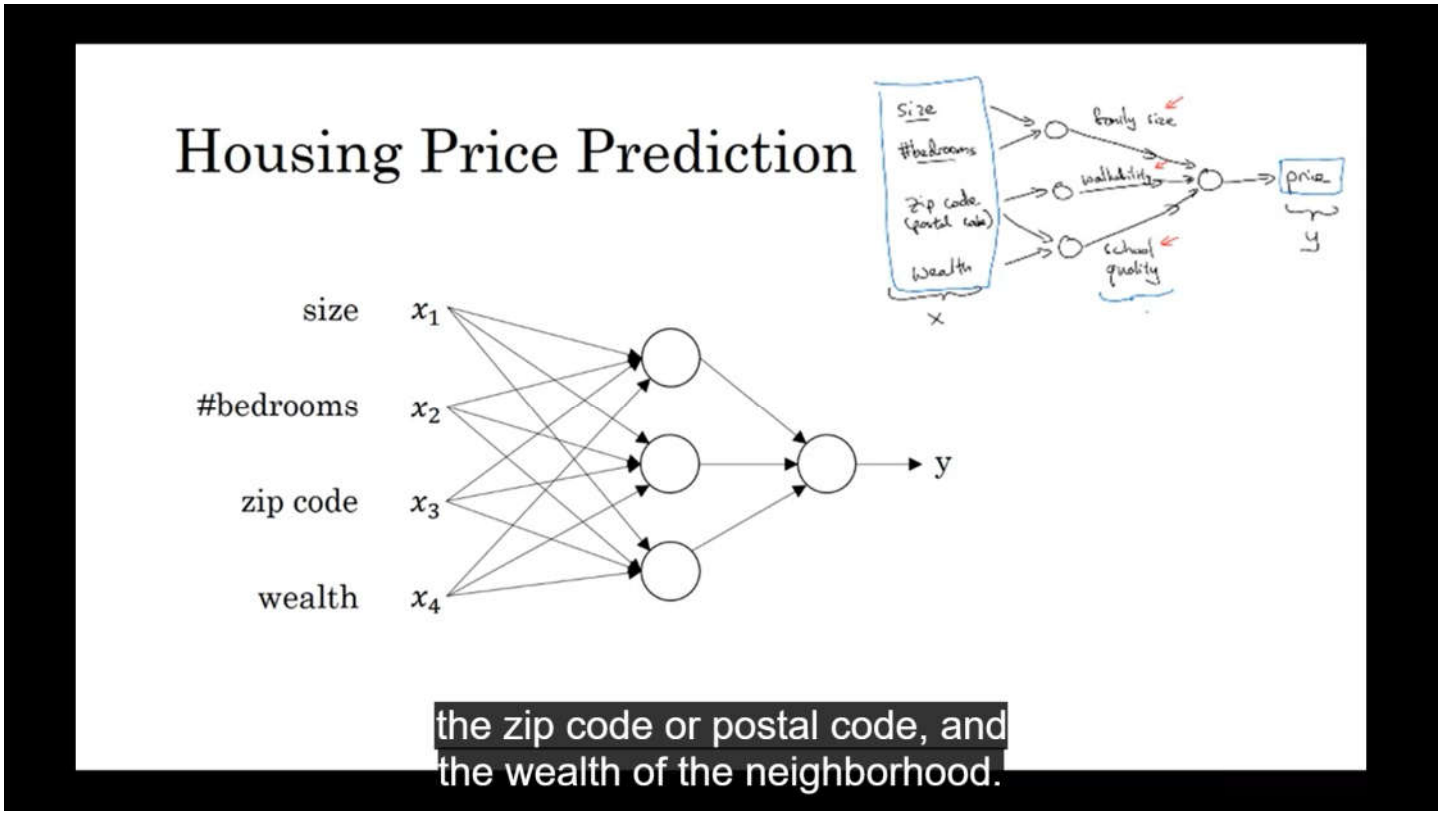

all this things in the middle, they will figure out by itself.

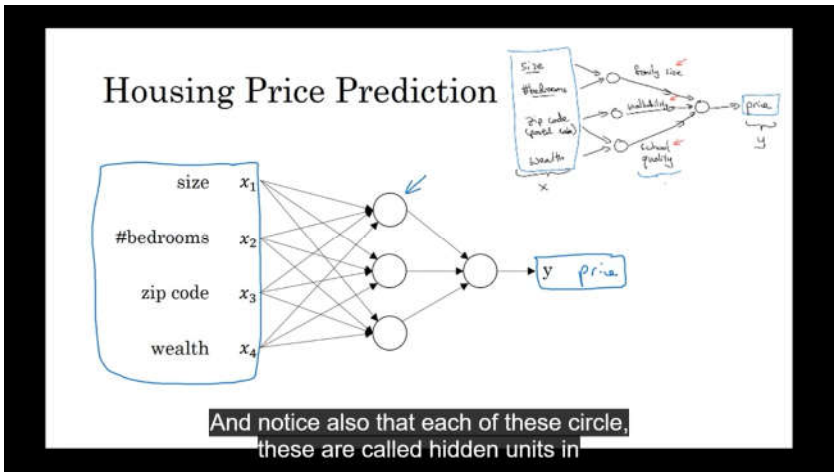
## Housing Price Prediction

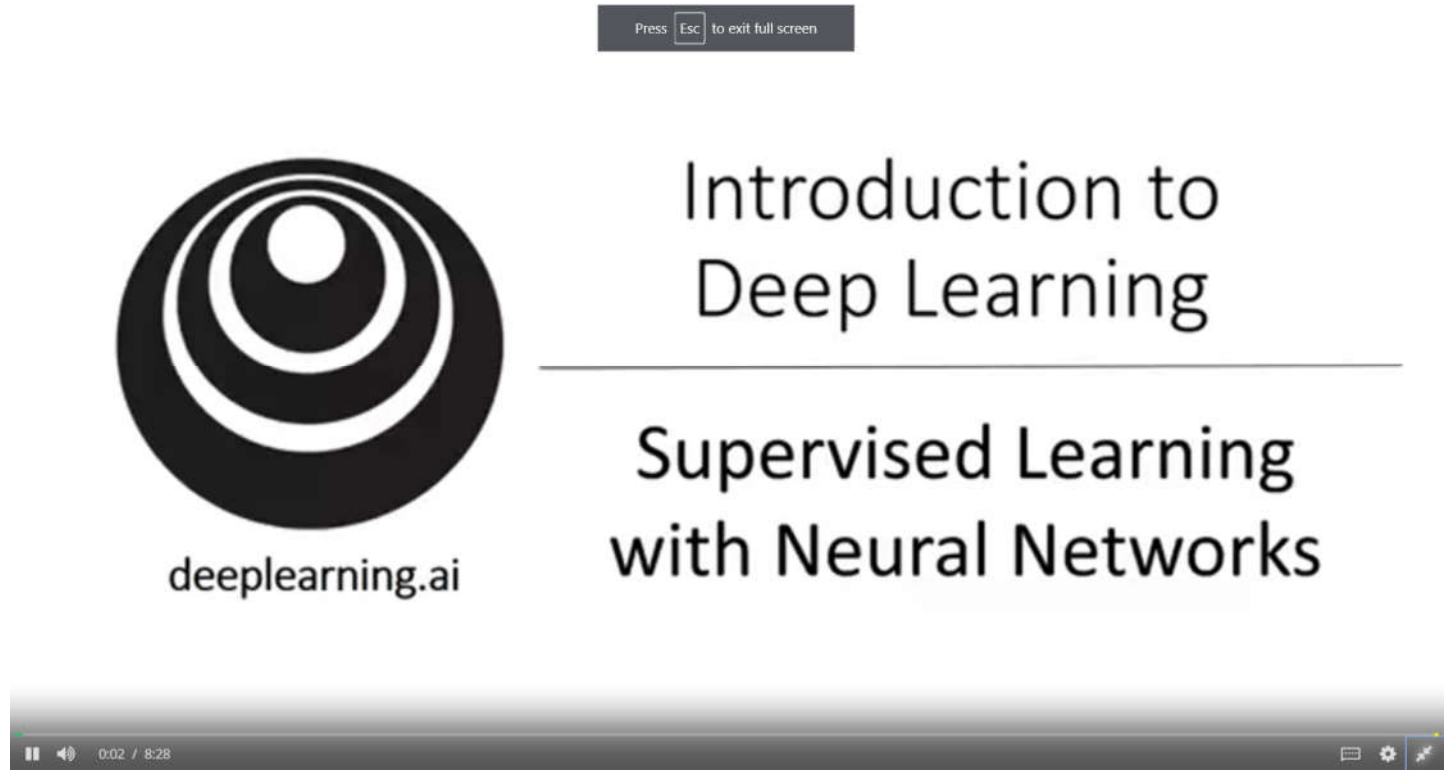



So what you actually implement is this.


Housing Price Prediction
size
#bedrooms
zip code
wealth
$x_1$
$x_2$
$x_3$
$x_4$
y
the zip code or postal code, and
the wealth of the neighborhood.


Housing Price Prediction
size
#bedrooms
zip code
wealth
$x_1$
$x_2$
$x_3$
$x_4$
y
And notice also that each of these circle,
these are called hidden units in




## 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 |

front of your car as well as some
information from a radar, and

# 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

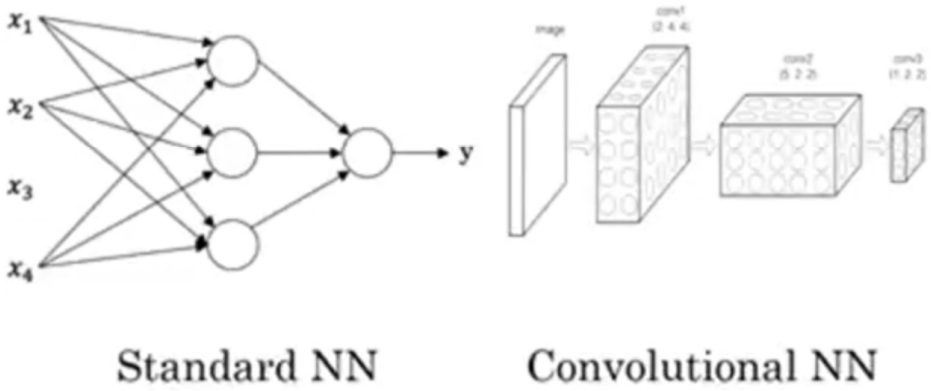
Custom/ Hybrid

# Neural Network examples

Standard NN

So in the literature you might have seen pictures like this.

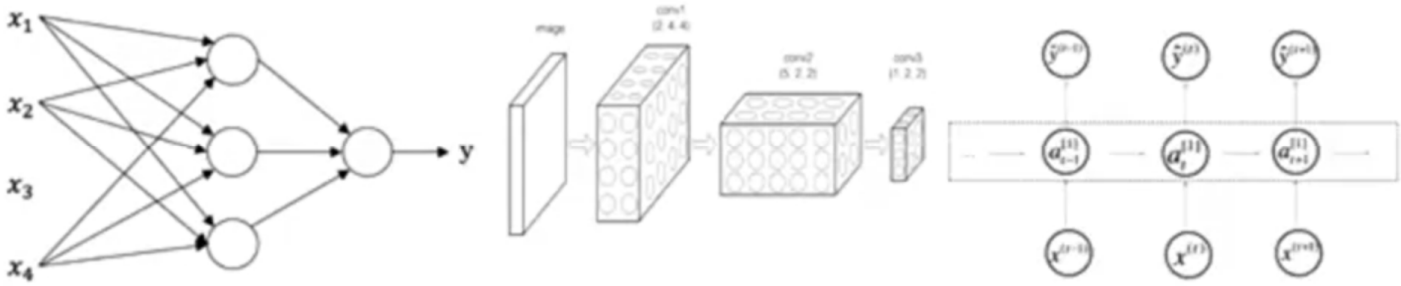
# Neural Network examples




Standard NN Convolutional NN

You might have seen pictures like this.

# Neural Network examples




Standard NN Convolutional NN Recurrent NN

But convolutional networks
are often use for image data.

# Supervised Learning

## Structured Data

## Unstructured Data

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

Structured Data means
basically databases of data.

# Supervised Learning

## Structured Data

## Unstructured 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 | | |

click on an ad, you might have information
about the user, such as the age,

# Supervised Learning

## Structured Data

| Size | #bedrooms | ... | Price (1000$s) |
|---|---|---|---|
| 2104 | 3 | | 400 |
| 1600 | 3 | | 330 |
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| User Age | Ad Id | ... | Click |
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| 41 | 93242 | | 1 |
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| ⋮ | ⋮ | | ⋮ |
| 27 | 71244 | | |

## Unstructured Data

Audio

Image

or images where you might want to recognize what's in the image or text.

# 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 | | |

## Unstructured Data

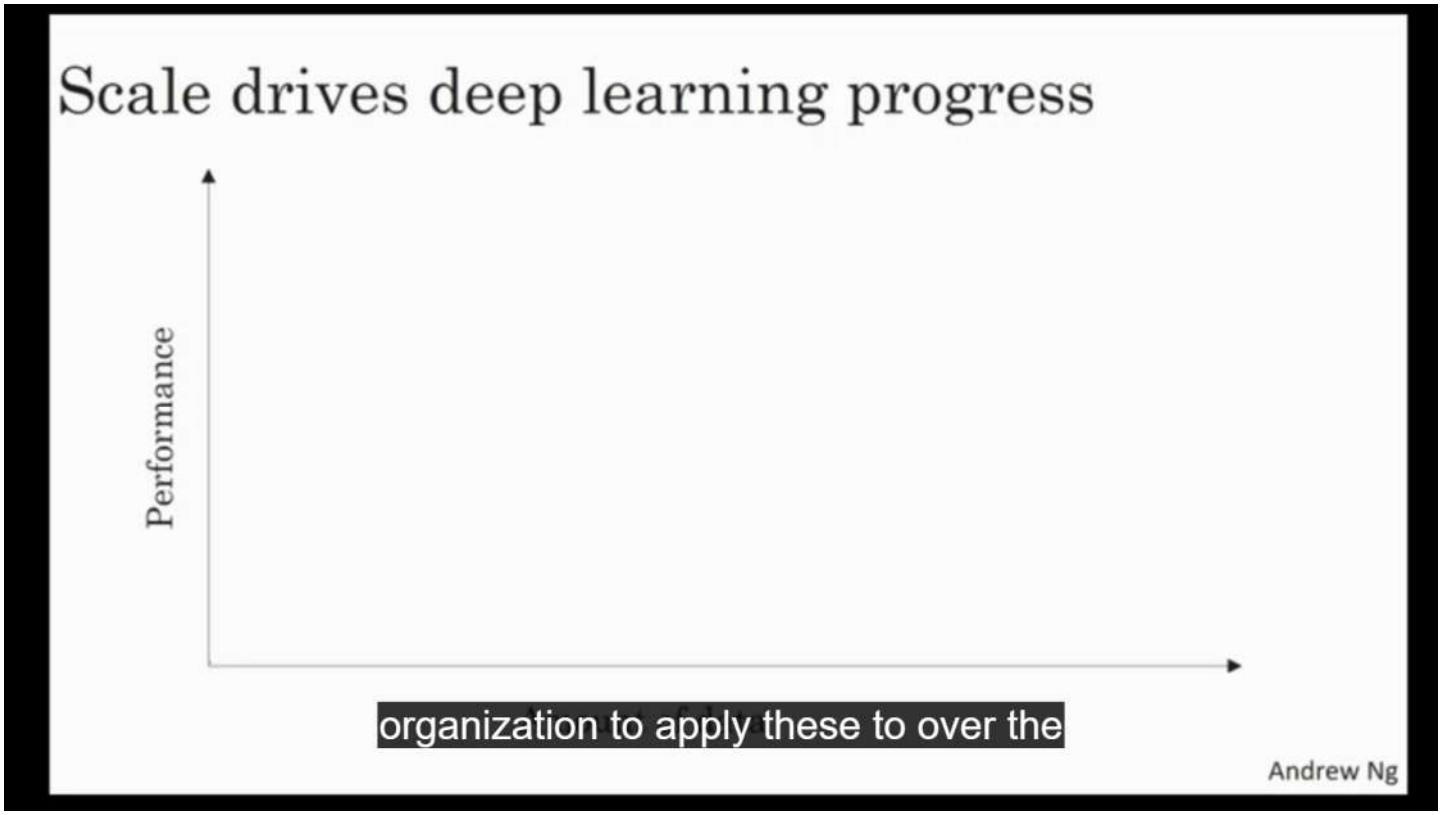
Audio

Image

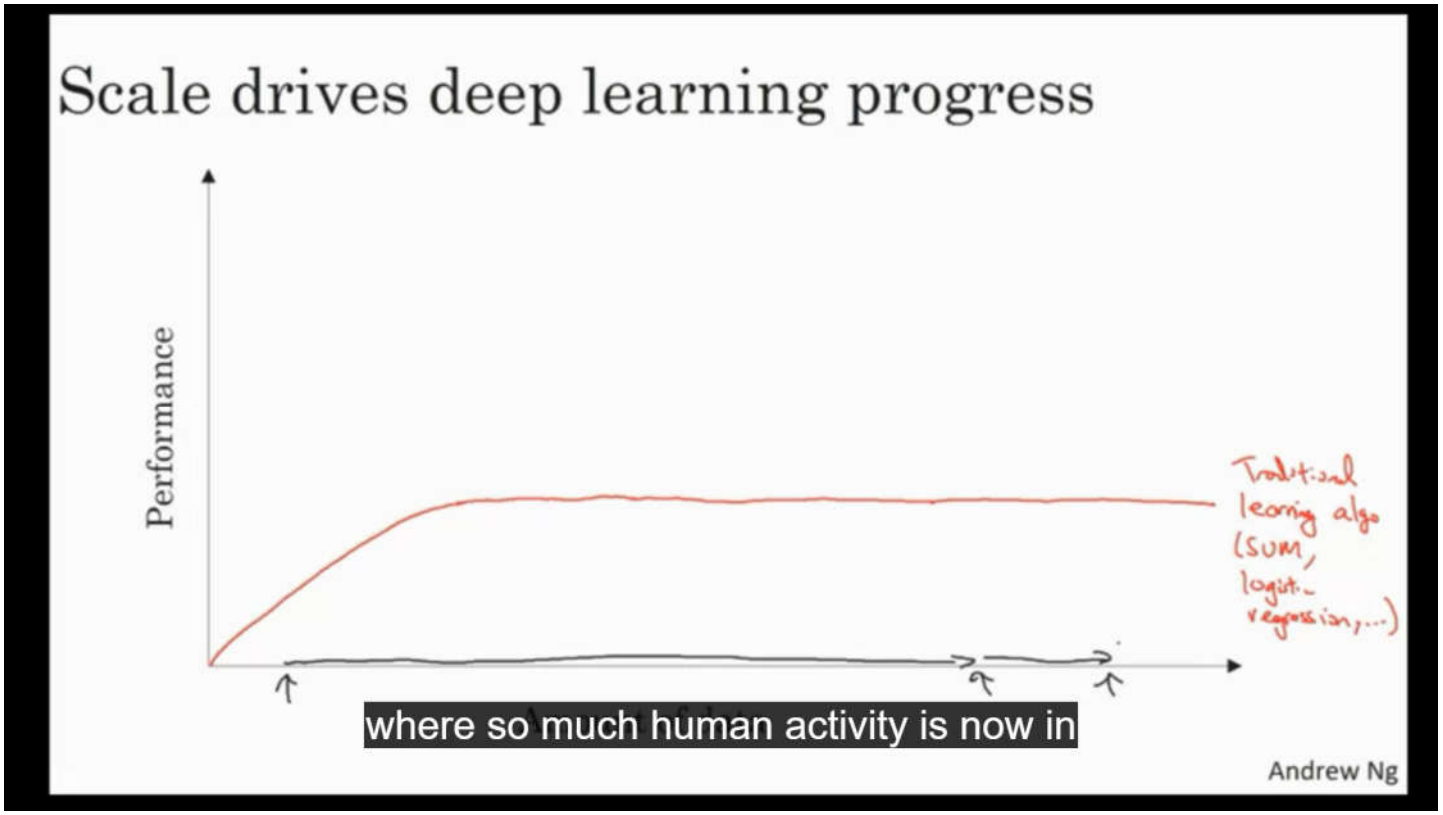
Four scores and seven years ago...

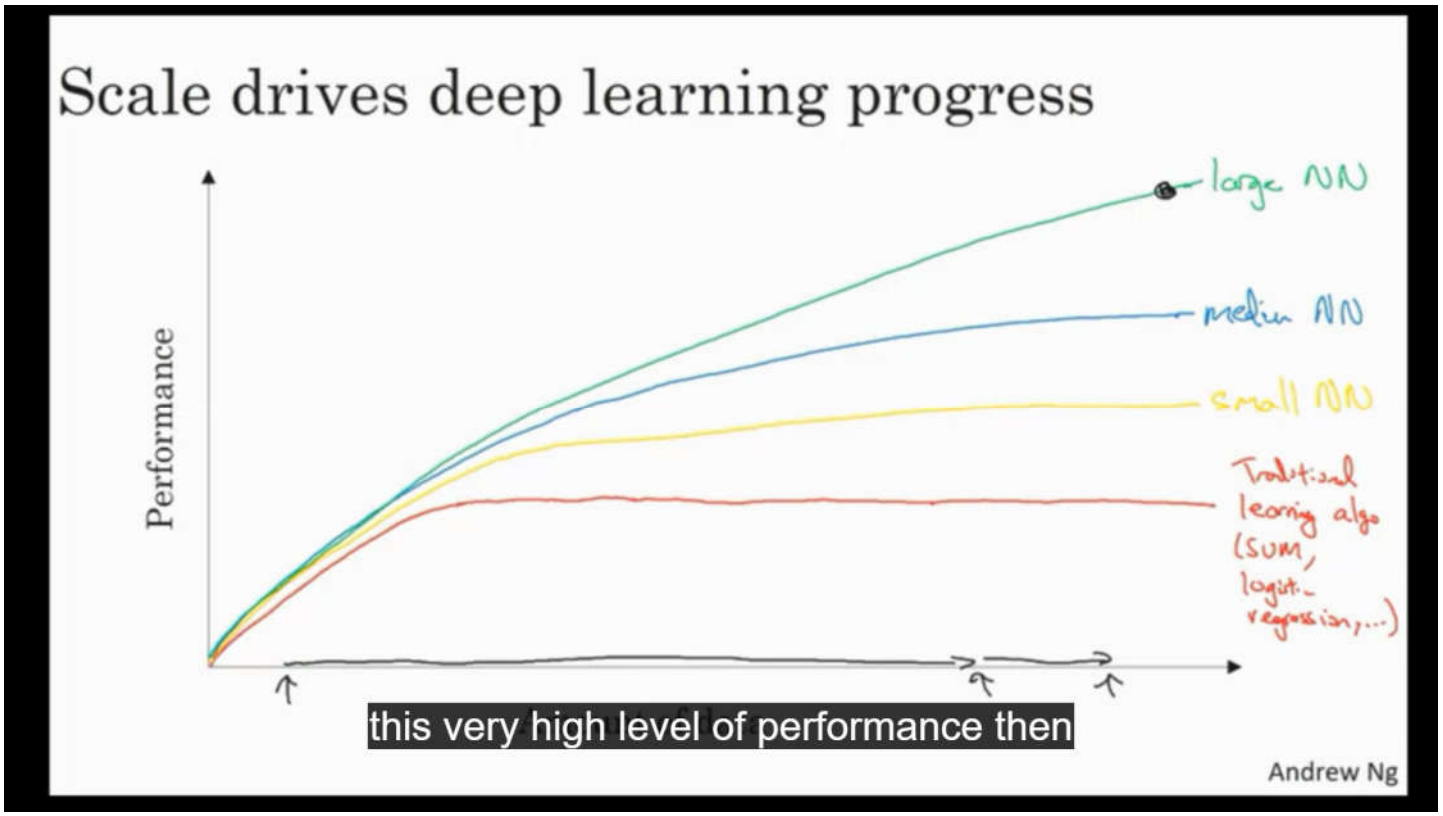
Text

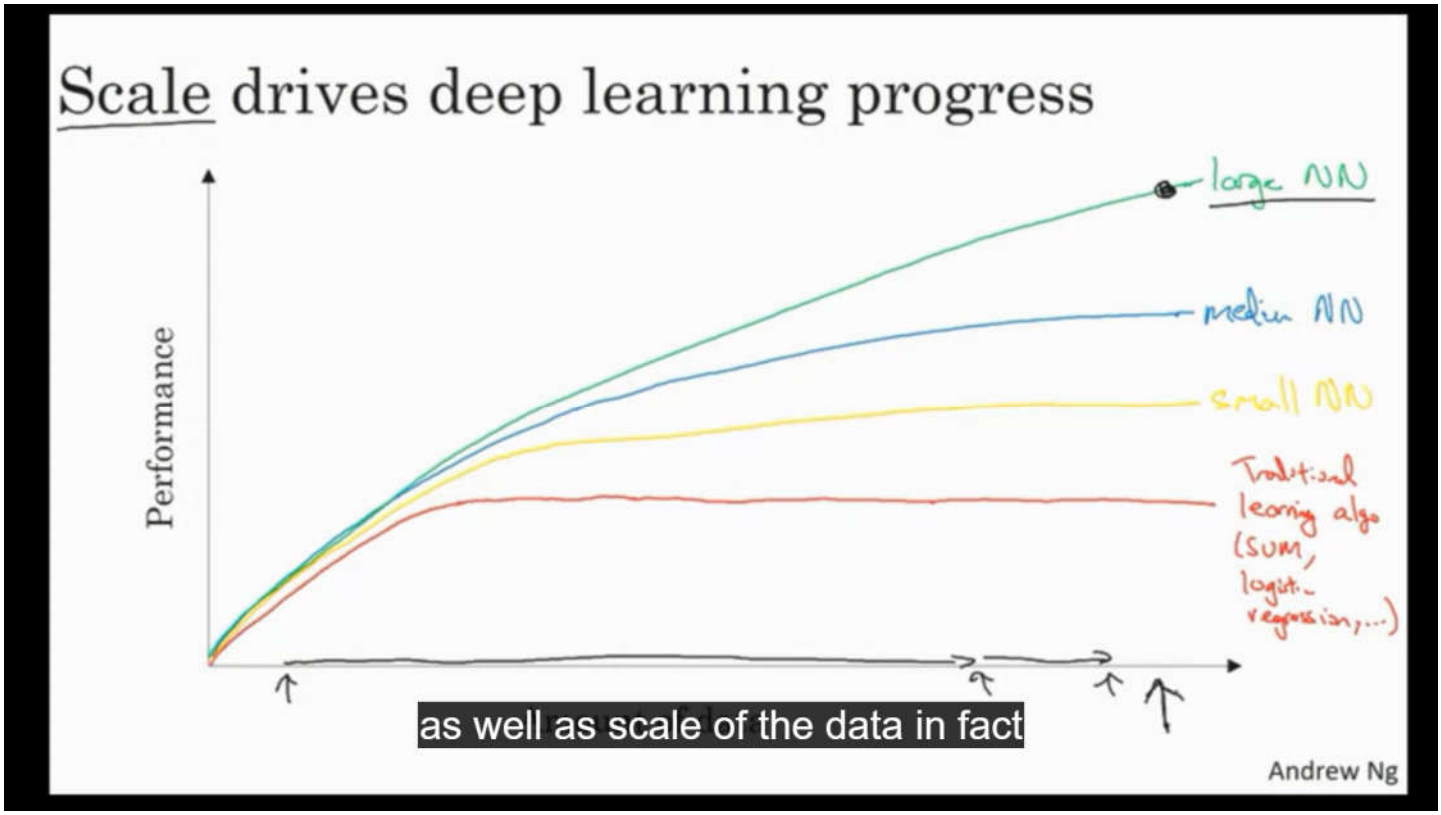
or images where you might want to recognize what's in the image or text.

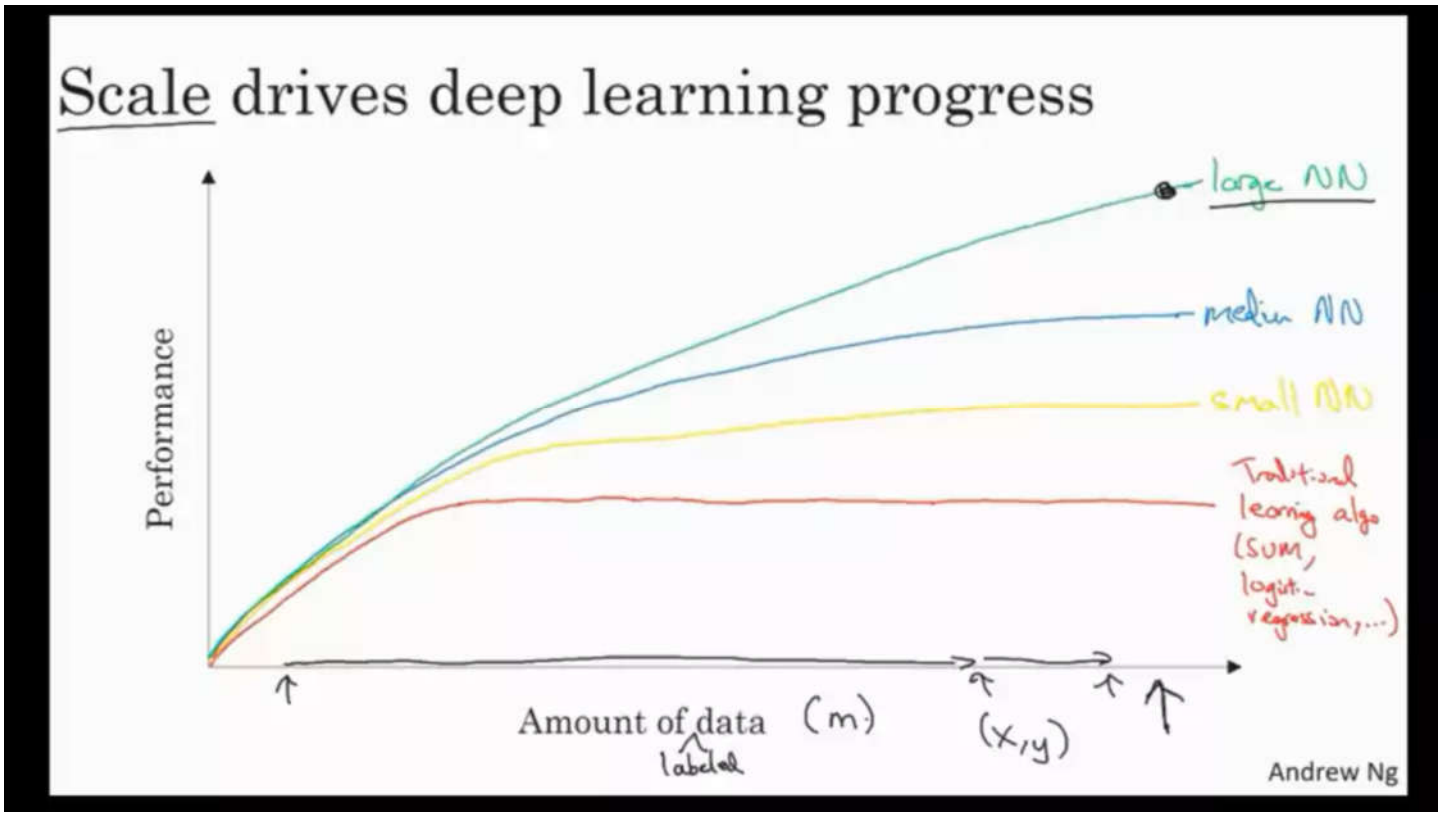

Scale drives deep learning progress
Performance
organization to apply these to over the
Andrew Ng

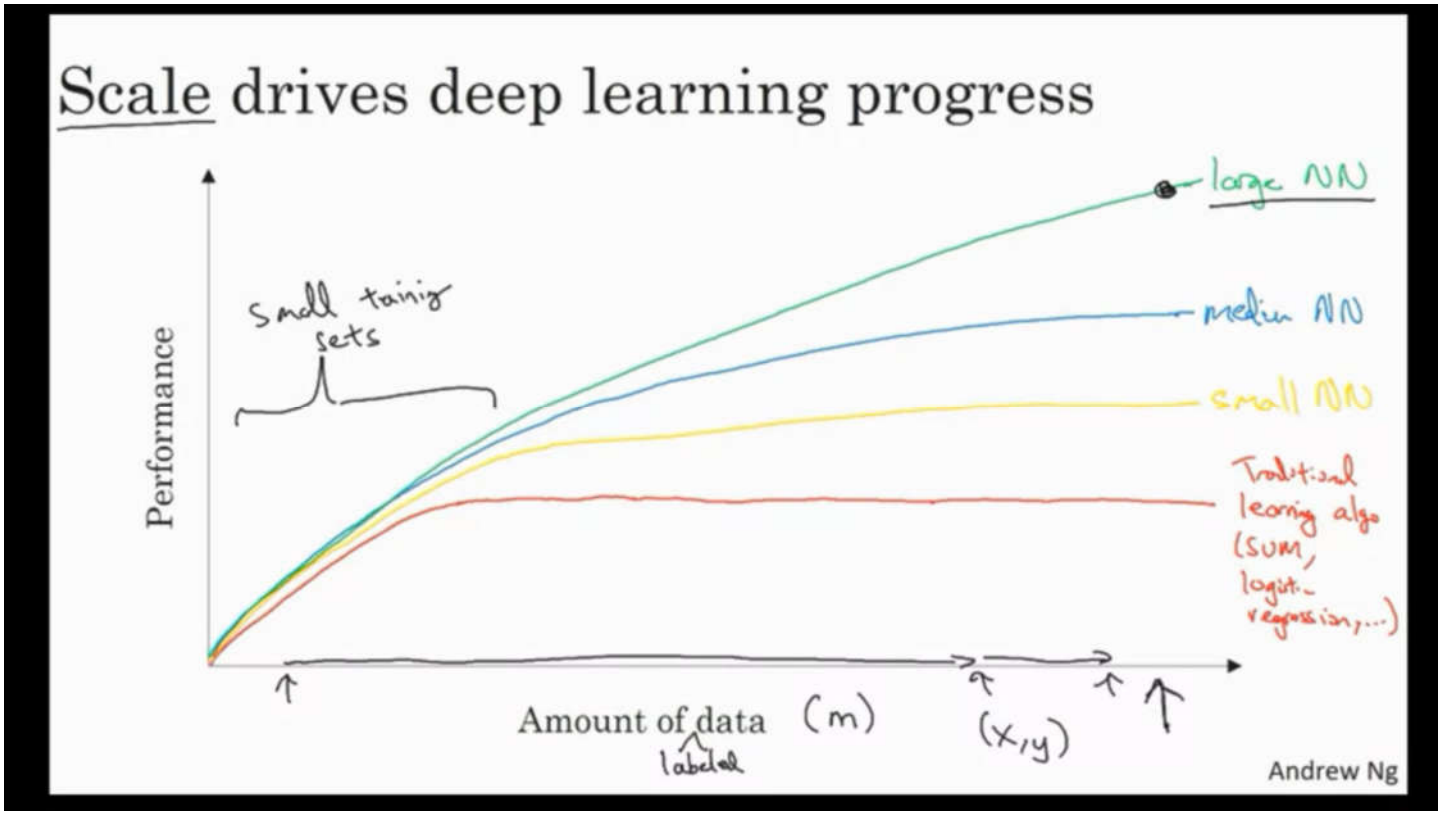
Press Esc to exit full screen
Scale drives deep learning progress
Performance
Amount of data
Andrew Ng
0:26 / 10:21

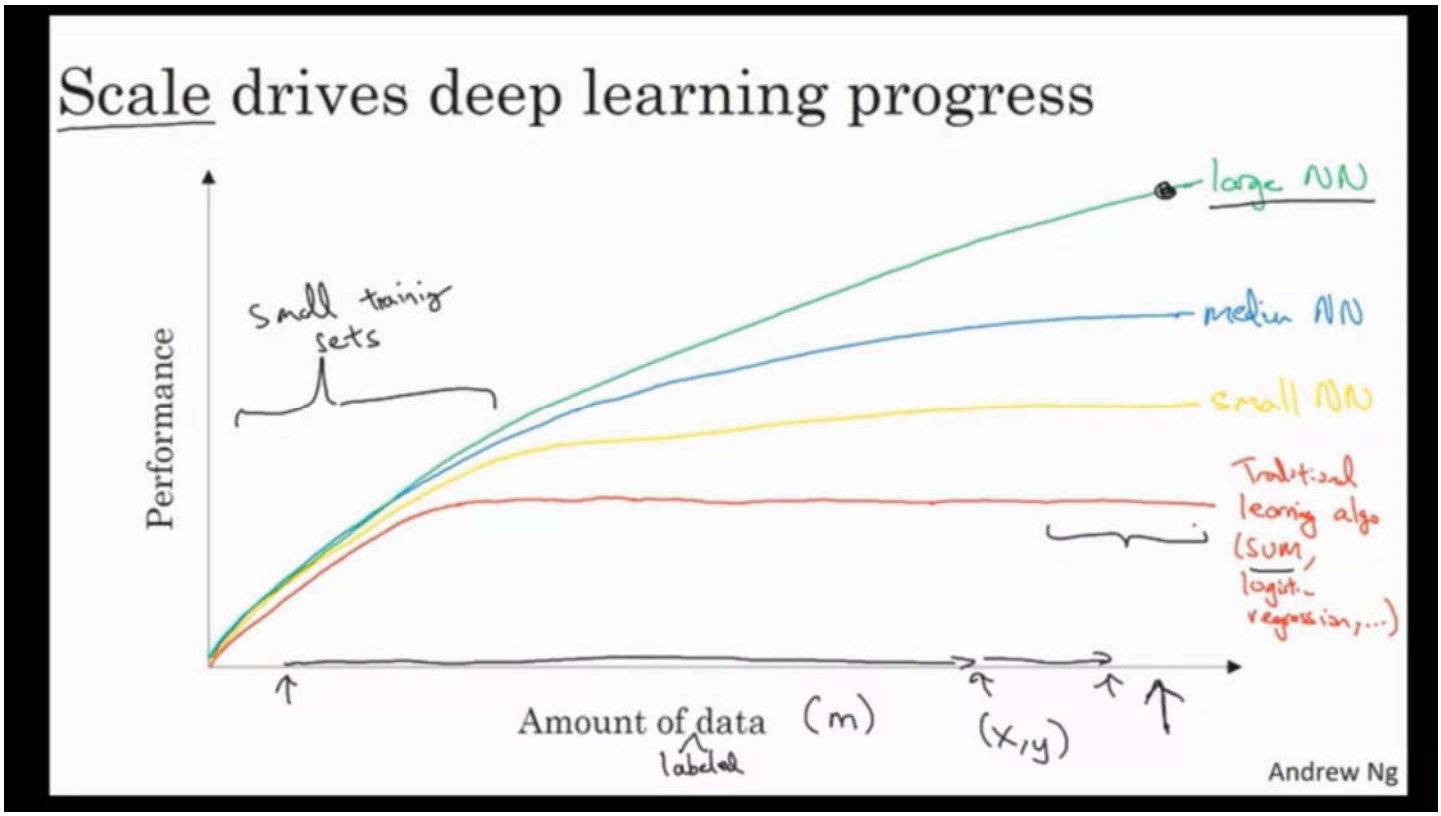

Scale drives deep learning progress
Performance
Traditional learning algo (SVM, logistic regression, ...)
where so much human activity is now in
Andrew Ng

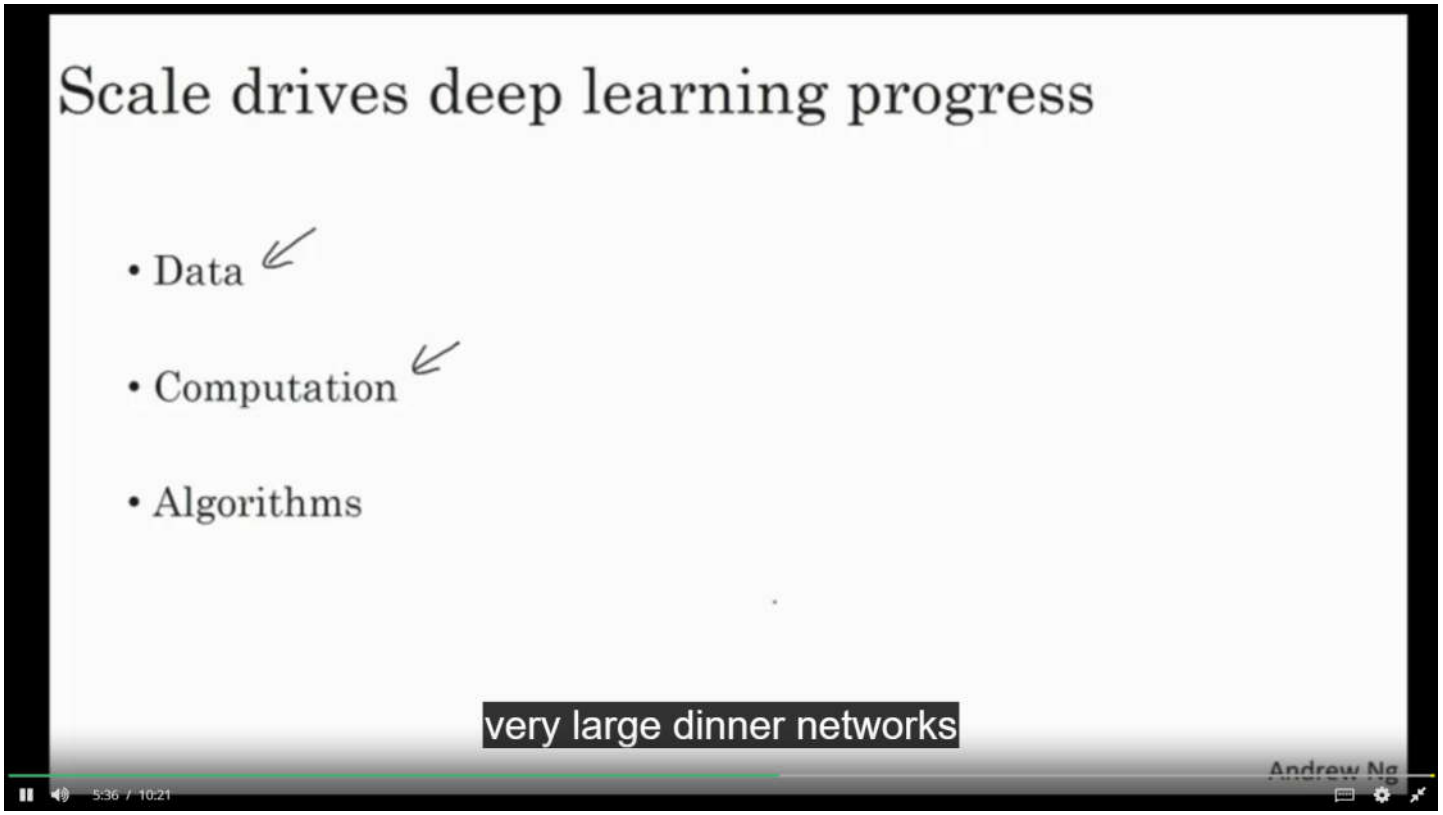

Scale drives deep learning progress
Performance
large NN
medium NN
small NN
Traditional learning algo (SVM, logistic regression, ...)
this very high level of performance then
Andrew Ng

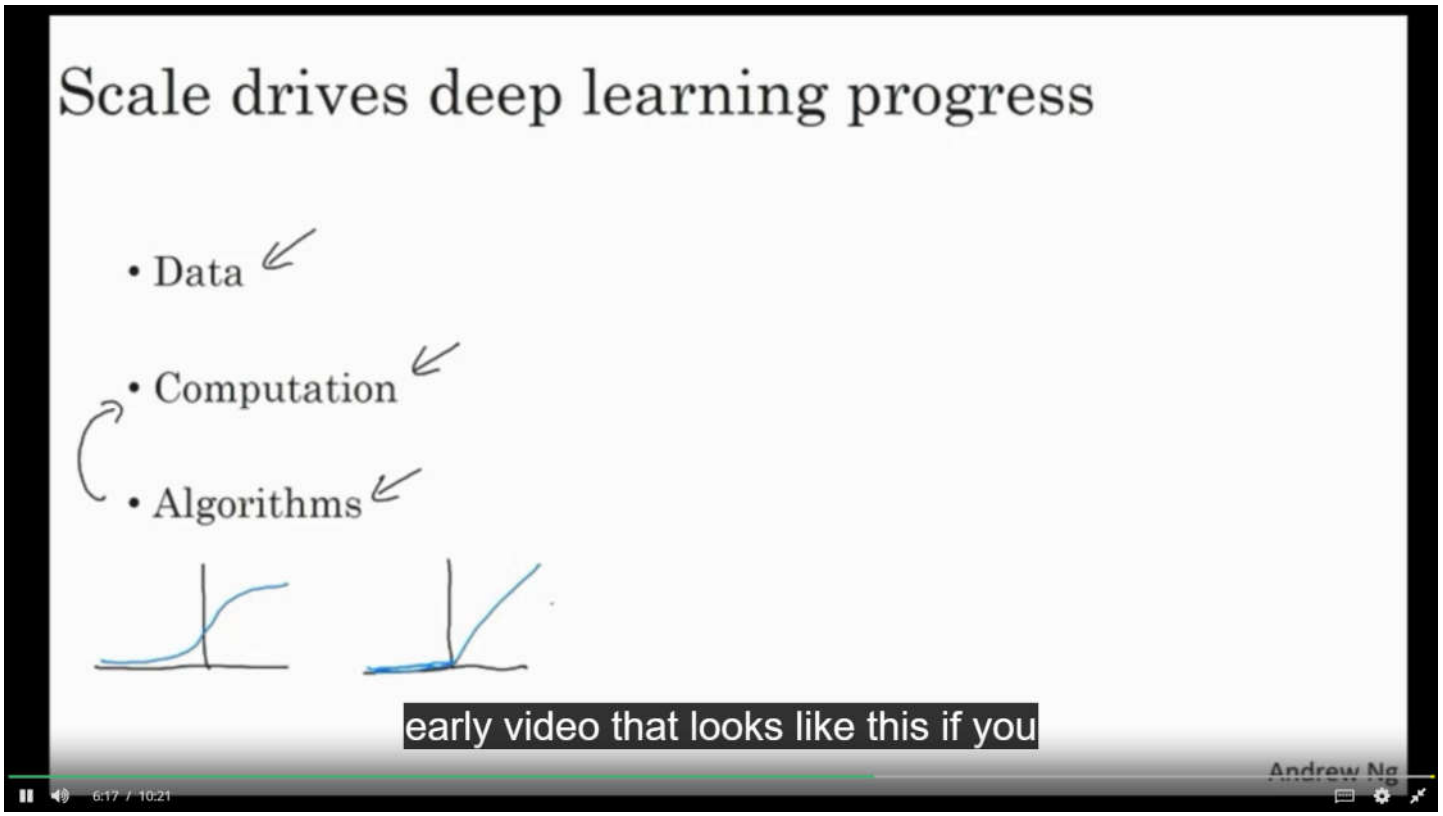

Scale drives deep learning progress
Performance
large NN
medium NN
small NN
Traditional learning algo (SVM, logistic regression, ...)
as well as scale of the data in fact
Andrew Ng


Scale drives deep learning progress
Performance
large NN
medium NN
small NN
Traditional learning algo (SVM, logistic regression, ...)
Amount of data (m)
labeled
(x, y)
Andrew Ng


Scale drives deep learning progress
Performance
Small training sets
large NN
medium NN
small NN
Traditional learning algo (SVM, logistic regression, ...)
Amount of data (m)
labeled
(x, y)
Andrew Ng

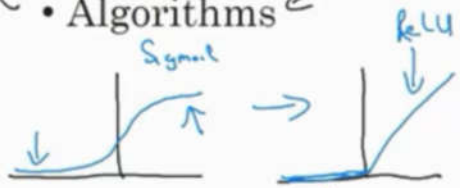

Scale drives deep learning progress
Performance
Small training sets
large NN
medium NN
small NN
Traditional learning algo (SVM, logistic regression, ...)
Amount of data (m)
labeled
(x, y)
Andrew Ng


Scale drives deep learning progress
• Data
• Computation
• Algorithms
very large dinner networks
Andrew Ng
5:36 / 10:21


Scale drives deep learning progress
• Data
• Computation
• Algorithms
early video that looks like this if you
Andrew Ng
6:17 / 10:21

# Scale drives deep learning progress

- Data
- Computation
- Algorithms

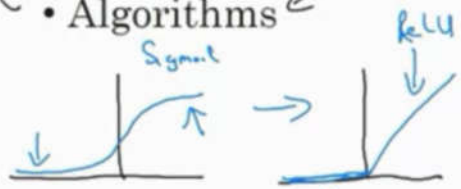


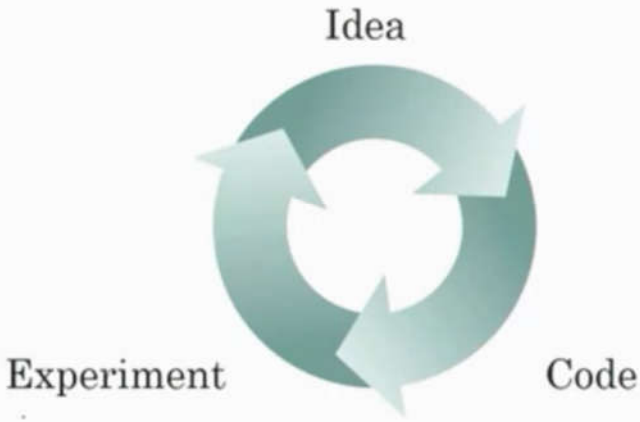

made an algorithm called gradient

Andrew Ng

# Scale drives deep learning progress

- Data
- Computation
- Algorithms



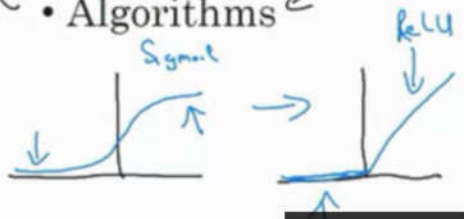



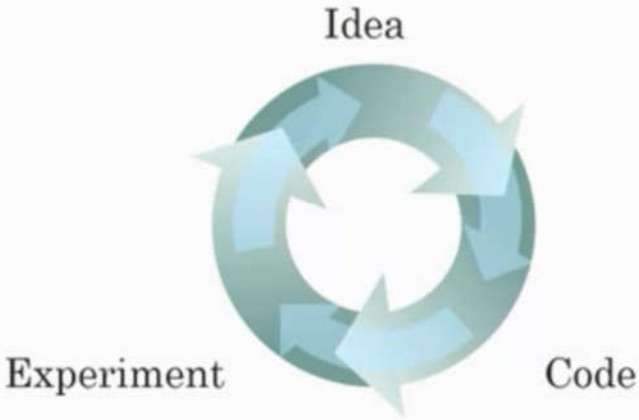

process of training your network this is

Andrew Ng

# Scale drives deep learning progress

- Data
- Computation
- Algorithms




go around this circle over and over and

Andrew Ng

What will the variable *m* denote in this course?

- Number of hidden layers
- Number of training examples

Correct

- The expected output
- Slope

Continue

deeplearning.ai

# Introduction to Neural Networks

## About this Course

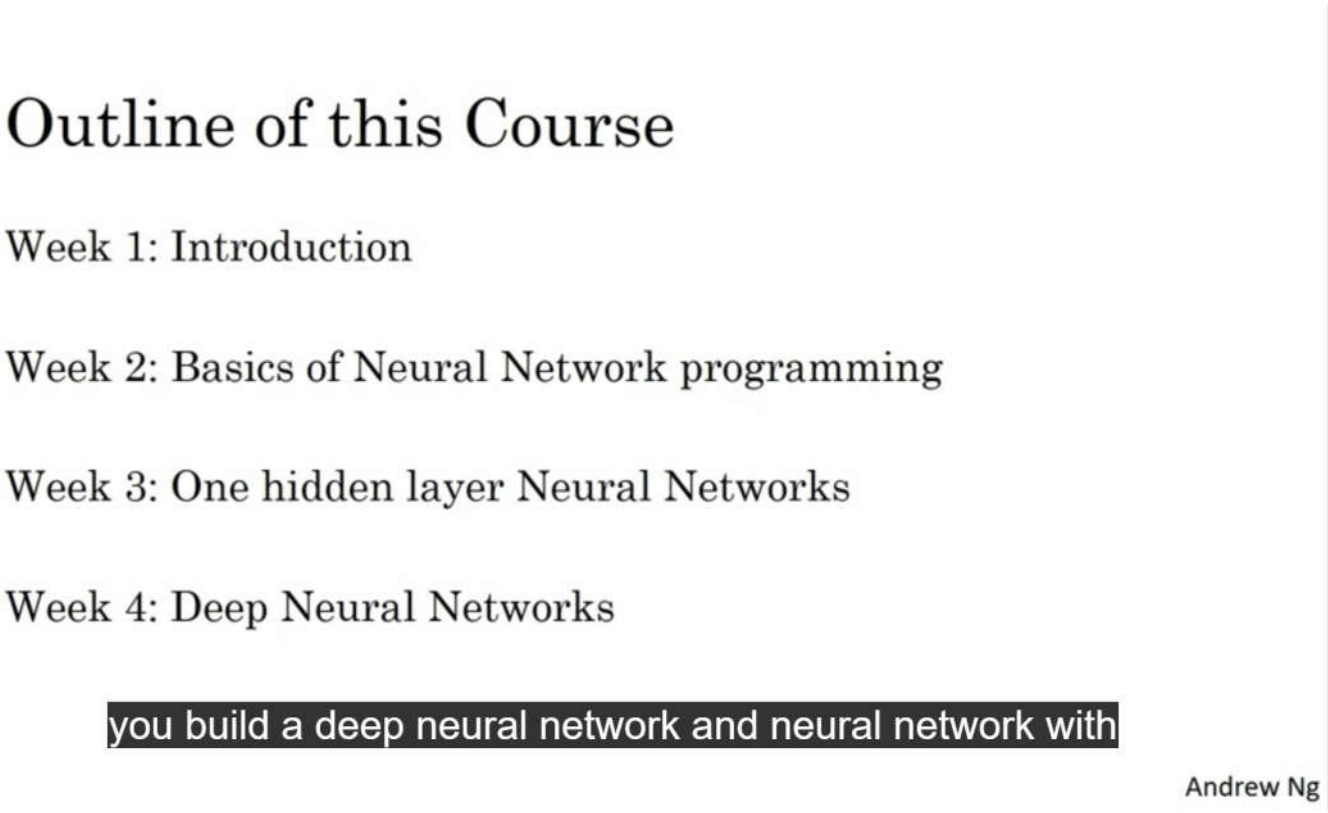
So you're just about to reach the end of

## 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

As I said in the first video,

Andrew Ng




# Frequently Asked Questions

Congratulations to be part of the first class of the Deep Learning Specialization! This form is here to help you find the answers to the commonly asked questions. We will update it as we receive new questions that we think are important for all learners.

## General Questions

***Q: I have an idea that would improve the course content. What can I do?*** A: Contact us at feedback@deeplearning.ai or put it in the forum "New ideas for the course". We are happy to collaborate with learners willing to improve the course! Thanks a lot.

***Q: I cannot submit my assignment?*** A: This issue should not be happening but if it does please let us know immediately. One temporary work around would be to download your notebook and go to the corresponding programming assignment tab ==> + Create Submission and upload it.

***Q: The audio in the videos is quite bad sometimes, muffled or low volume. Please fix it.*** A: You can mitigate the audio issues by turning down the bass and up the treble if you have those controls, or using a headset, which naturally emphasizes the higher frequencies. Also you may want to switch on the English closed captioning. Of course, we are working everyday to improve the quality of the videos and avoid anything that can affect your learning.

***Q: What does it mean when I see "Math Processing Error?"*** A: The page is attempting to use MathJax to render math symbols. Sometimes the content delivery network can be sluggish or you have caught the web page Ajax javascript code in an incomplete state. Normally just refreshing the page to make it load fully fixes the problem.

***Q: The video quality is bad?*** A: You could click the settings option in the video and upgrade the quality to High. (recommended if you have a good internet connection)

***Q: Is there a prerequisite for this course?*** A: Students are expected to have the following background:

- Very basic programming skills (i.e. ability to work

with dictionaries and for loops)

- Familiarity with basic machine learning (how do we represent a dataset as a matrix, etc.).
- Familiarity with the basic linear algebra (matrix multiplications, vector operations etc.).

***Q: Why do we have to use Python?*** A: Python is an open-source language, anyone can use it from anywhere in the world. It is widely used in academics (research labs) or in the industry. It has a useful library "Numpy" that makes math operations very easy. Python has several deep learning frameworks running on top of it (Tensorflow, Keras, PaddlePaddle, CNTK, Caffe, ...) and you are going to learn some of them. It is also easy to learn. Furthermore, we believe Python has a good future, as the community is really active and builds amazing stuff.

***Q: Has anyone figured out the how to solve this problem? Here is my code [Insert code].*** A: This is a violation of the Coursera Honor Code.

***Q: I've submitted correct answers for [insert problem]. However I would like to compare my implementation with other who did correctly.*** A: This is a violation of the Coursera Honor Code.

***Q: This is my email: [insert email]. Can we get the answer for the quiz?*** A: This is a violation of the Coursera Honor Code.

***Q: Do I receive a certificate once I complete this course?*** A: Course Certificate is available in this course.

***Q: What is the correct technique of entering a numeric answer to a text box question ?*** A: Coursera's software for numeric answers only supports '.' as the decimal delimiter (not ',') and require that fractions be simplified to decimals. For answers with many decimal digits, please use a 2 digits after decimal point rounding method when entering solutions if not mentioned in the question.

***Q: What is the correct technique of entering a 1 element matrix ?*** A: They should be entered as just the element without brackets.

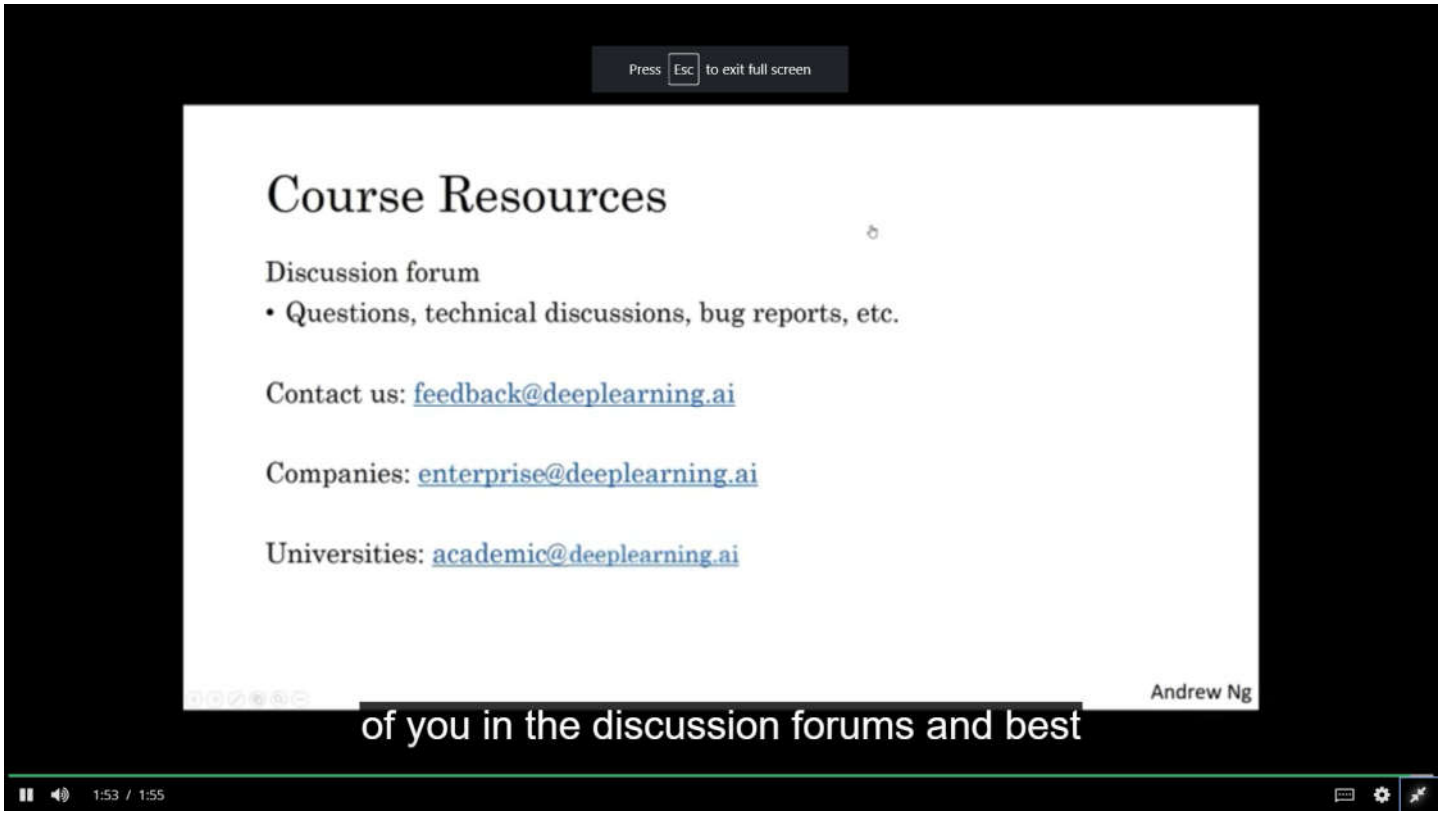
***Q: What does a A being a 3 element vector or a 3 dimensional vector mean?*** A: If not described a vector as mentioned in the questions is

$$A=\begin{bmatrix} element1 \\ element2 \\ element3 \end{bmatrix}.$$

***Q: I think I found an error in a video. What should I do?*** *A*: First, post it on the Errata forum. We will try to implement your feedback as soon as possible. You could also send us an email at feedback@deeplearning.ai.

***Q: My quiz grade displayed is wrong or I have a verification issue or I cannot retake a quiz. What should I do?*** *A*: Contact learner support. These queries can only be resolved by learner support and it is best if they are contacted directly. Do not flag such issues.

From <https://www.coursera.org/learn/neural-networks-deep-learning/supplement/CHeiR/frequently-asked-questions>




# How to Use Discussion Forums

## Upvoting Posts

When you enter the discussion forum for your course, you will see an Upvote button under each post. We encourage you to upvote posts you find thoughtful, interesting, or helpful. This is the best way to ensure that quality posts will be seen by other learners in the course. Upvoting will also increase the likelihood that important questions get addressed and answered.

## Report Abuse

Coursera's Code of Conduct prohibits:

- Bullying or threatening other users
- Posting spam or promotional content
- Posting mature content
- Posting assignment solutions (or other violations of the Honor Code)

Please report any posts that infringe upon copyright or are abusive, offensive, or that otherwise violate Coursera's Honor Code by using the Report this option found under the menu arrow to the right of each post.

## Following

If you find a particular thread interesting, click the **Follow** button under the original post of that thread page. When you follow a post, you will receive an email notification anytime a new post is made.

## Improving Your Posts

Course discussion forums are your chance to interact with thousands of like-minded individuals around the world. Getting their attention is one way to do well in this course. In any social interaction, certain rules of etiquette are expected and contribute to more enjoyable and productive communication. The following are tips for interacting in this course via the forums, adapted from guidelines originally compiled by AHA! and Chuq Von Rospach & Gene Spafford:

1. Stay on topic in existing forums and threads. Off-topic posts make it hard for other learners to find information they need. Post in the most appropriate forum for your topic, and do not post the same thing in multiple forums.
2. Use the filters at the top of the forum page (**Latest**, **Top**, and **Unanswered**) to find active, interesting content.
3. **Upvote** posts that are helpful and interesting.
4. Be civil. If you disagree, explain your position with respect and refrain from any and all personal attacks.
5. Stay on topic. In particular, don't change the subject in the middle of an existing thread – just start a new topic.
6. Make sure you're understood, even by non-native English speakers. Try to write full sentences, and avoid text-message abbreviations or slang. Be careful when you use humor and sarcasm as these messages are easy to misinterpret.
7. If asking a question, provide as much information as possible, what you've already considered, what you've already read, etc.
8. Cite appropriate references when using someone else's ideas, thoughts, or words.
9. Do not use a forum to promote your product, service, or business.
10. Conclude posts by inviting other learners to extend the discussion. For example, you could say "I would love to understand what others think."
11. Do not post personal information about other posters in the forum.
12. Report spammers.

For more details, refer to Coursera's Forum Code of Conduct.

These tips and tools for interacting in this course via the forums were adapted from guidelines originally by The University of Illinois.

From <https://www.coursera.org/learn/neural-networks-deep-learning/supplement/0cJ9A/how-to-use-discussion-forums>