

# Introduction to Deep Learning

## Latest Submission Grade 95%

1. Which of the following best describes the role of AI in the expression "an AI-powered society"?

1 / 1 point

- ☒ AI is an essential ingredient in realizing tasks, in industry and in personal life.
- ☐ AI controls the power grids for energy distribution, so all the power needed for industry and in daily life comes from AI.
- ☐ AI finds the most efficient way of charging the devices we use daily.
- ☐ AI helps to create a more efficient way of producing energy to power industries and personal devices.
- ☒ **Correct**  
In an AI-powered society AI plays a fundamental role to complete most tasks, in industry and personal life.

2. Which of these are reasons for Deep Learning recently taking off? (Check the three options that apply.)

1 / 1 point

- ☐ Neural Networks are a brand new field.
- ☒ Deep learning has resulted in significant improvements in important applications such as online advertising, speech recognition, and image recognition.
- ☒ **Correct**  
These were all examples discussed in lecture 3.
- ☒ We have access to a lot more computational power.



**Correct**

Yes! The development of hardware, perhaps especially GPU computing, has significantly improved deep learning algorithms' performance.



We have access to a lot more data.

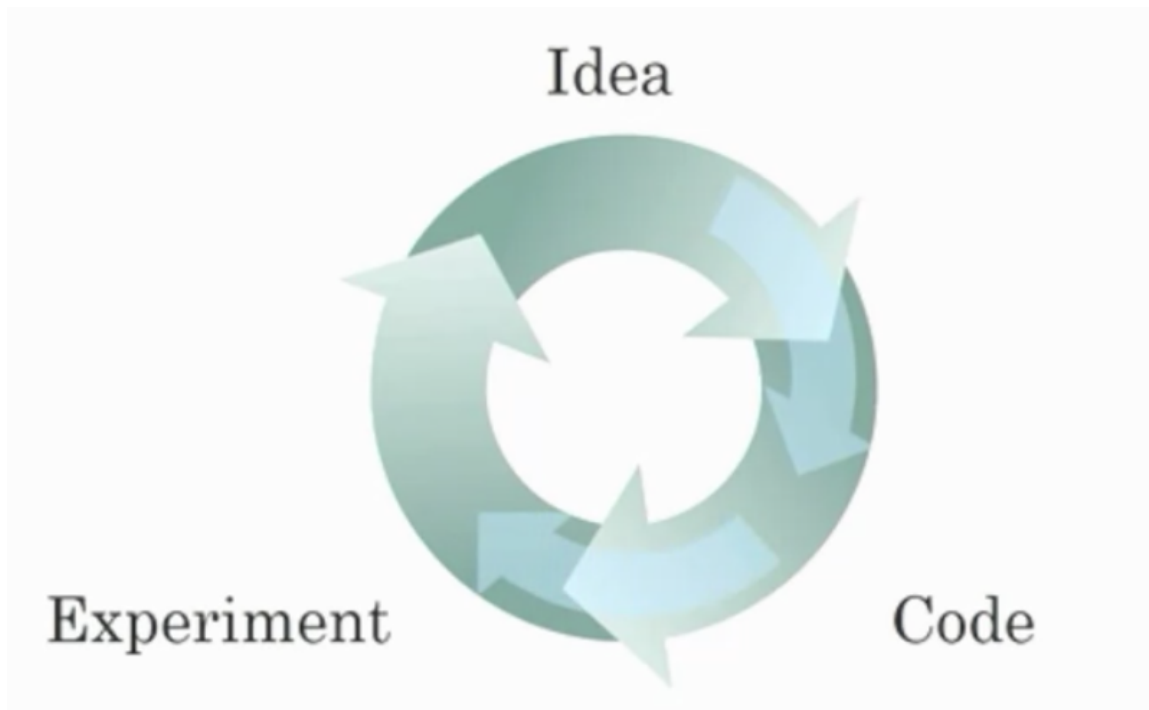


**Correct**

Yes! The digitalization of our society has played a huge role in this.

3. Recall this diagram of iterating over different ML ideas. Which of the statements below are true? (Check all that apply.)

**0.75 / 1 point**



Larger amounts of data allow researchers to try more ideas and then produce better algorithms in less time.



Improvements in the GPU/CPU hardware enable the discovery of better Deep Learning algorithms.



**Correct**

Yes. By speeding up the iterative process, better hardware allows researchers to discover better algorithms.

☒ Better algorithms can speed up the iterative process by reducing the necessary computation time.



**Correct**

Yes. Recall how the introduction of the ReLU activation function helped reduce the time needed to train a model.



Better algorithms allow engineers to get more data and then produce better Deep Learning models.



**This should not be selected**

New algorithms may help to handle larger amounts of data but not to get more data to use in experiments.

4. Neural networks are good at figuring out functions relating an input  $x$  to an output  $y$  given enough examples. True/False?

1 / 1 point



False



True



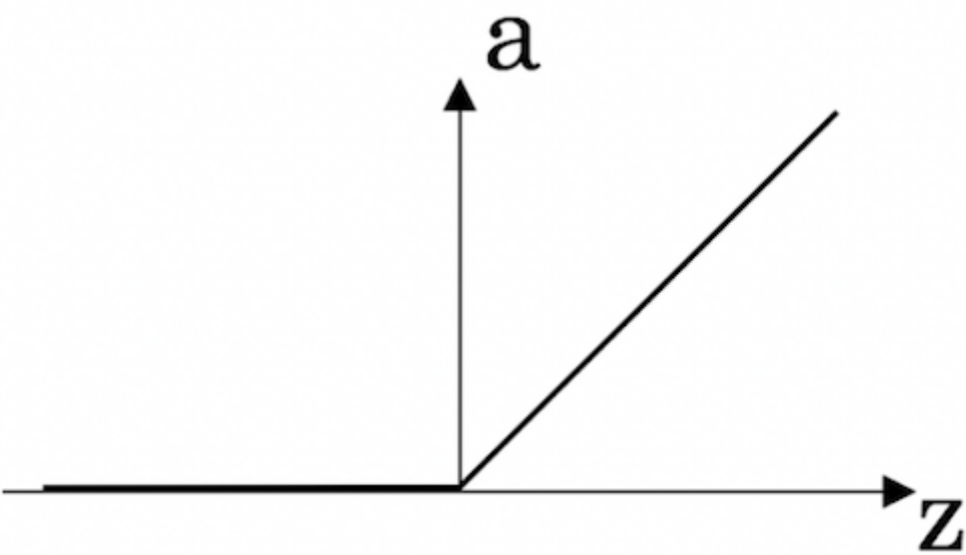
**Correct**

Exactly, with neural networks, we don't need to "design" features by ourselves. The neural network figures out the necessary relations given enough data.

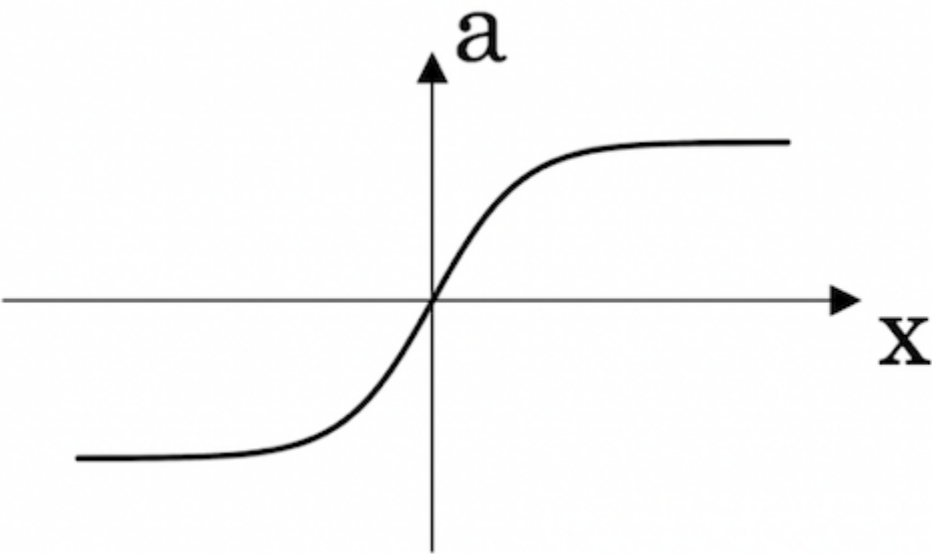
5. Which one of these plots represents a ReLU activation function?

1 / 1 point

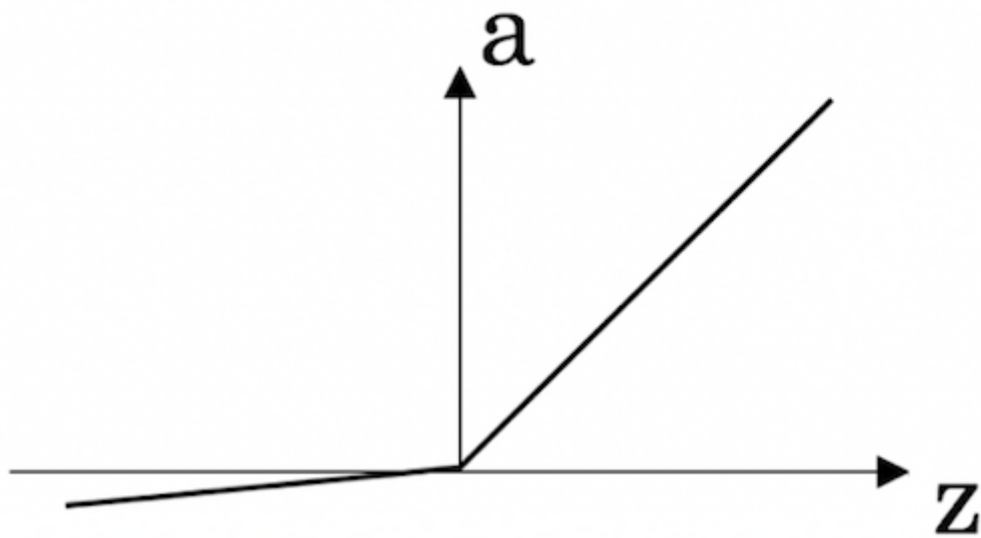
☒ Figure 3:



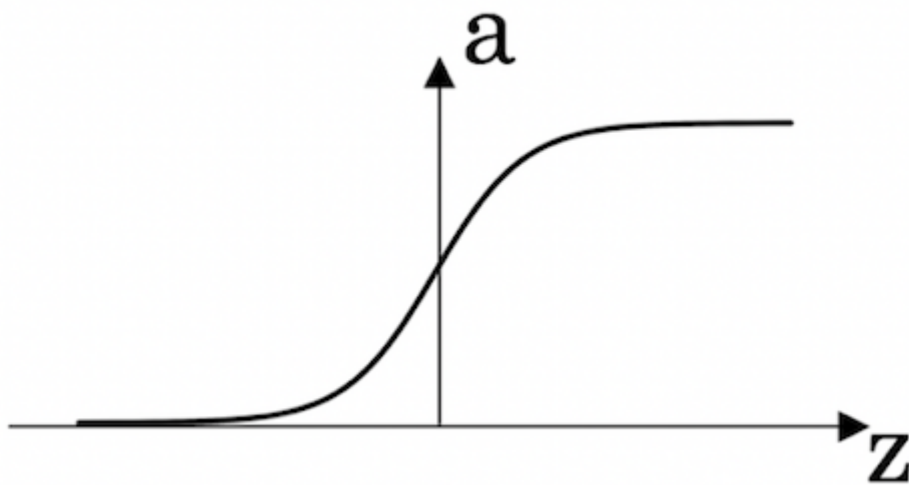
☐ Figure 1:



☐ Figure 4:



☐ Figure 2:



**Correct**

Correct! This is the ReLU activation function, the most used in neural networks.

6. Which of the following are examples of unstructured data? Choose all that apply.

0.75 / 1 point

☒ Images for bird recognition.



**Correct**

Yes, images are an example of "unstructured" data.

☐ Text describing size and number of pages of books.

☒ Sound files for speech recognition.



**Correct**

Yes, audio is an example of "unstructured" data.

☐ Information about elephants' weight, height, age, and the number of offspring.

You didn't select all the correct answers

7. A dataset is composed of age and weight data for several people. This dataset is an example of "structured" data because it is represented as an array in a computer. True/False?

1 / 1 point

☒ True

☐ False



**Correct**

Yes, the sequences can be represented as arrays in a computer. This is an example of structured data.

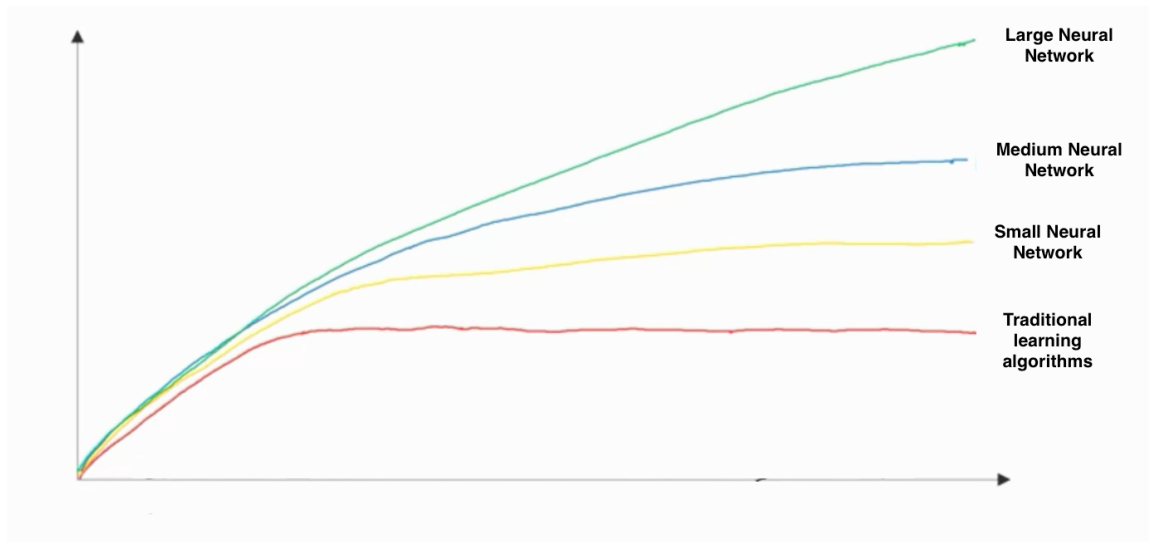
8. Why is an RNN (Recurrent Neural Network) used for machine translation, say translating English to French? (Check all that apply.)

1 / 1 point

- ☐ It is strictly more powerful than a Convolutional Neural Network (CNN).
- ☒ It is applicable when the input/output is a sequence (e.g., a sequence of words).
- ☒ **Correct**  
Yes. An RNN can map from a sequence of english words to a sequence of french words.
- ☒ It can be trained as a supervised learning problem.
- ☒ **Correct**  
Yes. We can train it on many pairs of sentences x (English) and y (French).
- ☐ RNNs represent the recurrent process of Idea->Code->Experiment->Idea->....

9. In this diagram which we hand-drew in the lecture, what do the horizontal axis (x-axis) and vertical axis (y-axis) represent?

1 / 1 point



- ☐ • x-axis is the amount of data
- y-axis is the size of the model you train.

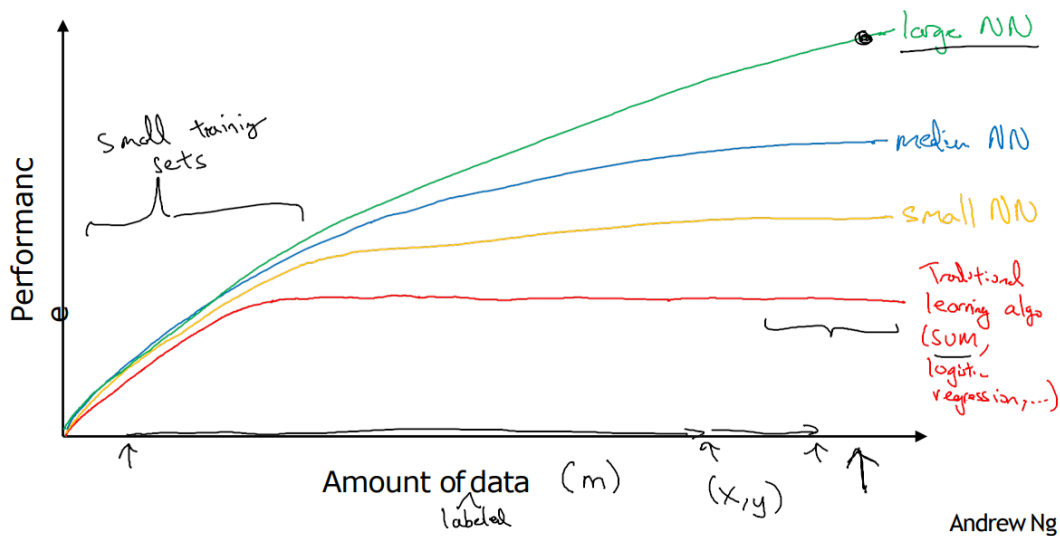
- ☐ • x-axis is the input to the algorithm
- y-axis is outputs.
- ☒ • x-axis is the amount of data
- y-axis (vertical axis) is the performance of the algorithm.
- ☐ • x-axis is the performance of the algorithm
- y-axis (vertical axis) is the amount of data.

✓ **Correct**

10. Assuming the trends described in the figure are accurate. The performance of a NN depends only on the size of the NN. True/False?

1 / 1 point

## Scale drives deep learning progress



☐ True

☒ False

✓ **Correct**

Yes. According to the trends in the figure above, It also depends on the amount of data.



