Introduction to deep learning

LATEST SUBMISSION GRADE

100%

1. **What does the analogy "AI is the new electricity" refer to?** 1 / 1 point

- ○ AI is powering personal devices in our homes and offices, similar to electricity.
- ○ Through the "smart grid", AI is delivering a new wave of electricity.
- ○ AI runs on computers and is thus powered by electricity, but it is letting computers do things not possible before.
- ◉ Similar to electricity starting about 100 years ago, AI is transforming multiple industries.

✓ **Correct**
Yes. AI is transforming many fields from the car industry to agriculture to supply-chain...

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.
- ☑ 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.

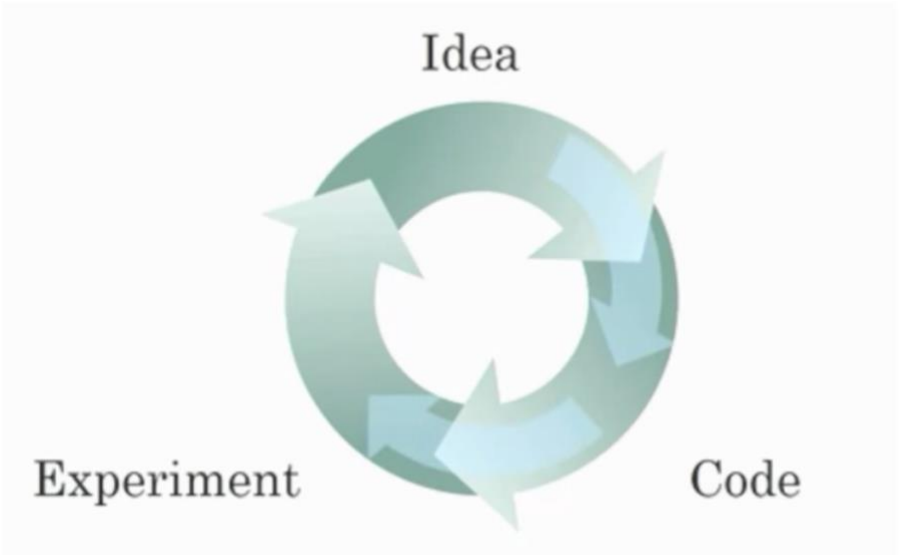
- ☑ Deep learning has resulted in significant improvements in important applications such as online advertising, speech recognition, and image recognition.

✓ **Correct**
These were all examples discussed in lecture 3.

- ☑ We have access to a lot more 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.)** 1 / 1 point



- [x] Being able to try out ideas quickly allows deep learning engineers to iterate more quickly.

  ✓ **Correct**
  Yes, as discussed in Lecture 4.

- [x] Faster computation can help speed up how long a team takes to iterate to a good idea.

  ✓ **Correct**
  Yes, as discussed in Lecture 4.

- [ ] It is faster to train on a big dataset than a small dataset.

- [x] Recent progress in deep learning algorithms has allowed us to train good models faster (even without changing the CPU/GPU hardware).

  ✓ **Correct**
  Yes. For example, we discussed how switching from sigmoid to ReLU activation functions allows faster training.

4. **When an experienced deep learning engineer works on a new problem, they can usually use insight from previous problems to train a good model on the first try, without needing to iterate multiple times through different models. True/False?** 1 / 1 point

- ( ) True
- (•) False

  ✓ **Correct**
  Yes. Finding the characteristics of a model is key to have good performance. Although experience can help, it requires multiple iterations to build a good model.

5. **Which one of these plots represents a ReLU activation function?** 1 / 1 point

Figure 1:

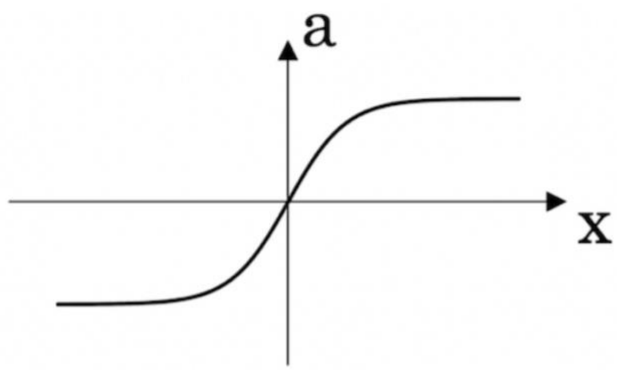


Figure 2:

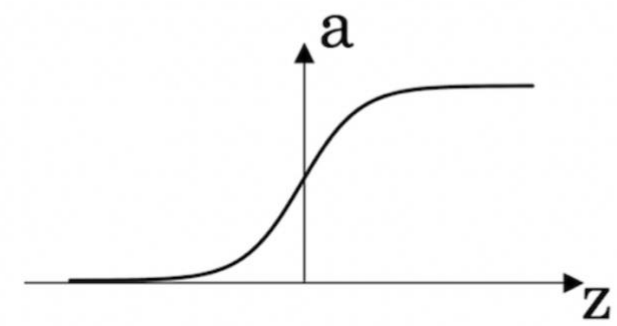


Figure 3:

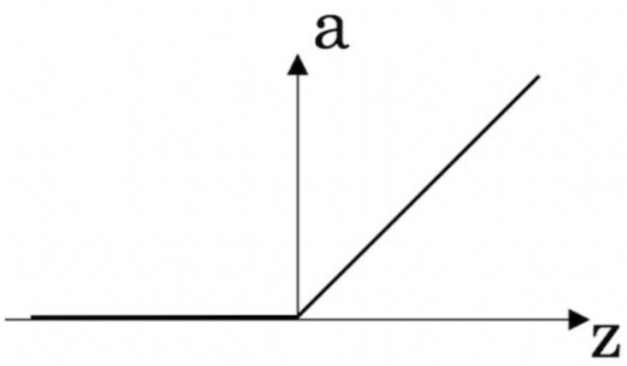
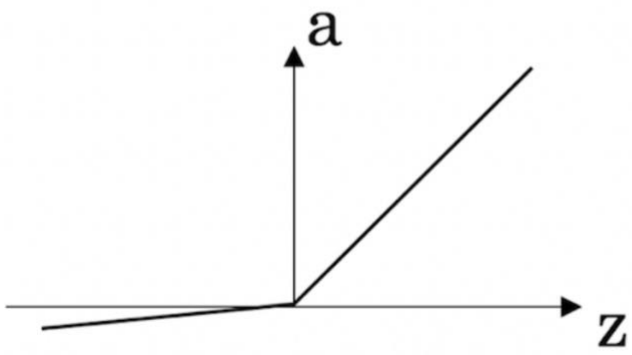


Figure 4:



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

6. **Images for cat recognition is an example of "structured" data, because it is represented as a structured array in a computer. True/False?** 1 / 1 point

True

False

Correct
Yes. Images for cat recognition is an example of "unstructured" data.

7. **A demographic dataset with statistics on different cities' population, GDP per capita, economic growth is an example of "unstructured" data because it contains data coming from different sources. True/False?** 1 / 1 point

- ○ True
- ◉ False

✓ **Correct**
A demographic dataset with statistics on different cities' population, GDP per capita, economic growth is an example of "structured" data by opposition to image, audio or text datasets.

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 can be trained as a supervised learning problem.

✓ **Correct**
Yes. We can train it on many pairs of sentences x (English) and y (French).

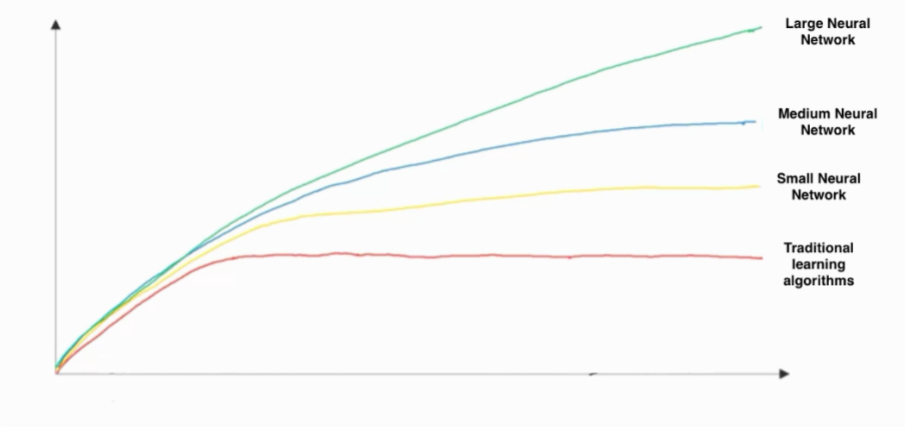
- ☐ It is strictly more powerful than a Convolutional Neural Network (CNN).
- ☑ It is applicable when the input/output is a sequence (e.g., a sequence of words).

✓ **Correct**
Yes. An RNN can map from a sequence of english words to a sequence of french words.

- ☐ RNNs represent the recurrent process of Idea->Code->Experiment->Idea->....

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

1 / 1 point



- x-axis is the performance of the algorithm
  - y-axis (vertical axis) is the amount of data.
- x-axis is the amount of data
  - y-axis (vertical axis) is the performance of the algorithm.
- 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.

✓ **Correct**

10. **Assuming the trends described in the previous question's figure are accurate (and hoping you got the axis labels right), which of the following are true? (Check all that apply.)** 1 / 1 point

- [x] Increasing the size of a neural network generally does not hurt an algorithm's performance, and it may help significantly.

  ✓ **Correct**
  Yes. According to the trends in the figure above, big networks usually perform better than small networks.

- [x] Increasing the training set size generally does not hurt an algorithm's performance, and it may help significantly.

  ✓ **Correct**
  Yes. Bringing more data to a model is almost always beneficial.

- [ ] Decreasing the training set size generally does not hurt an algorithm's performance, and it may help significantly.

- [ ] Decreasing the size of a neural network generally does not hurt an algorithm's performance, and it may help significantly.