

Neural Networks II

Overview

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Daily Quiz

2

Debate prep and debate

3

Neural networks: The forward pass

4

Neural networks: The backward pass

5

Assignments feedback

Daily Quiz



www.harrymayne.com



Discussion

Two Debates

Two debates

- Groups of 5 (all must speak)

1. **“Introducer”** → Job is to **explain** the claim without bias from your side of the argument.
2. **Argument 1**
3. **Argument 2**
4. **Argument 3**
5. **“Finisher”** → Job is to respond to the other arguments

Two debates

1

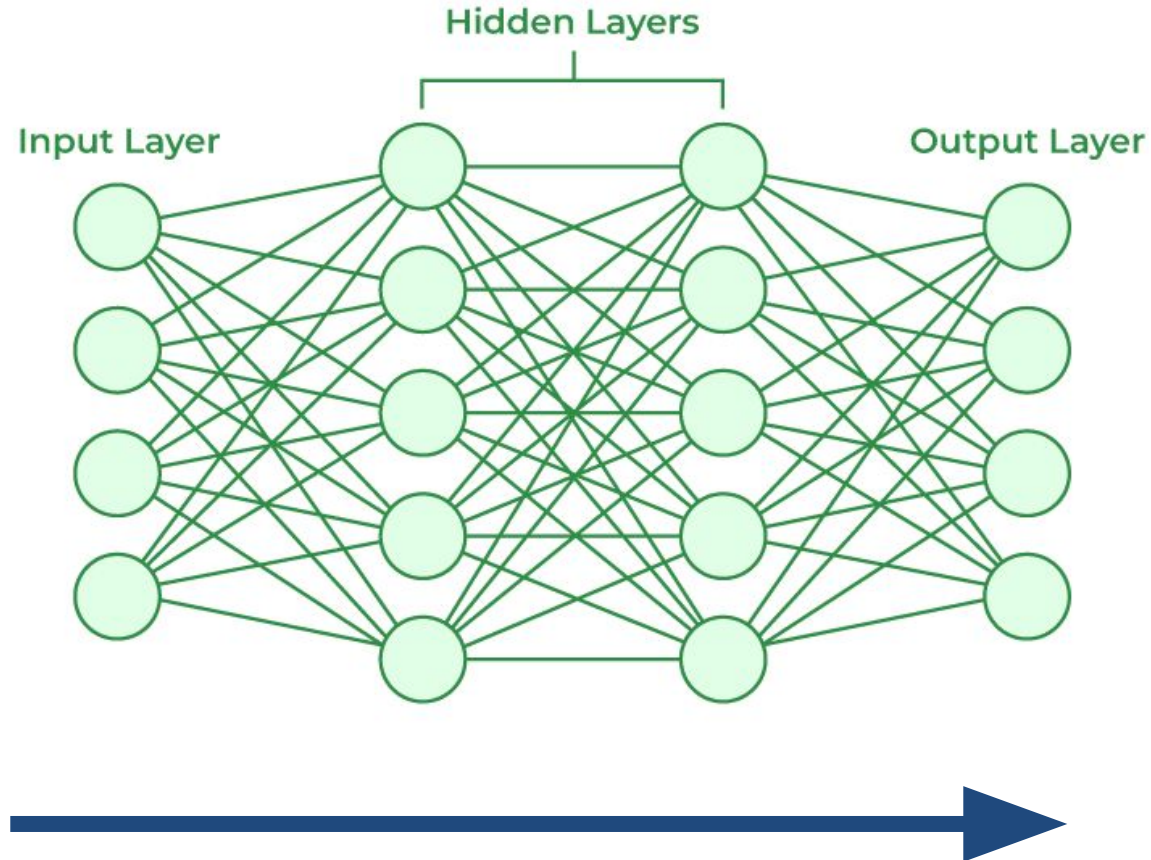
Some people argue that artificial neural networks, the mechanism behind current AI successes, are similar to biological neural networks because of their design and performance. Do you agree with this?

2

“Deep learning is hitting a wall”. Do you agree with this statement?

The Forward Pass

The forward pass (training and test)



[Source](#)



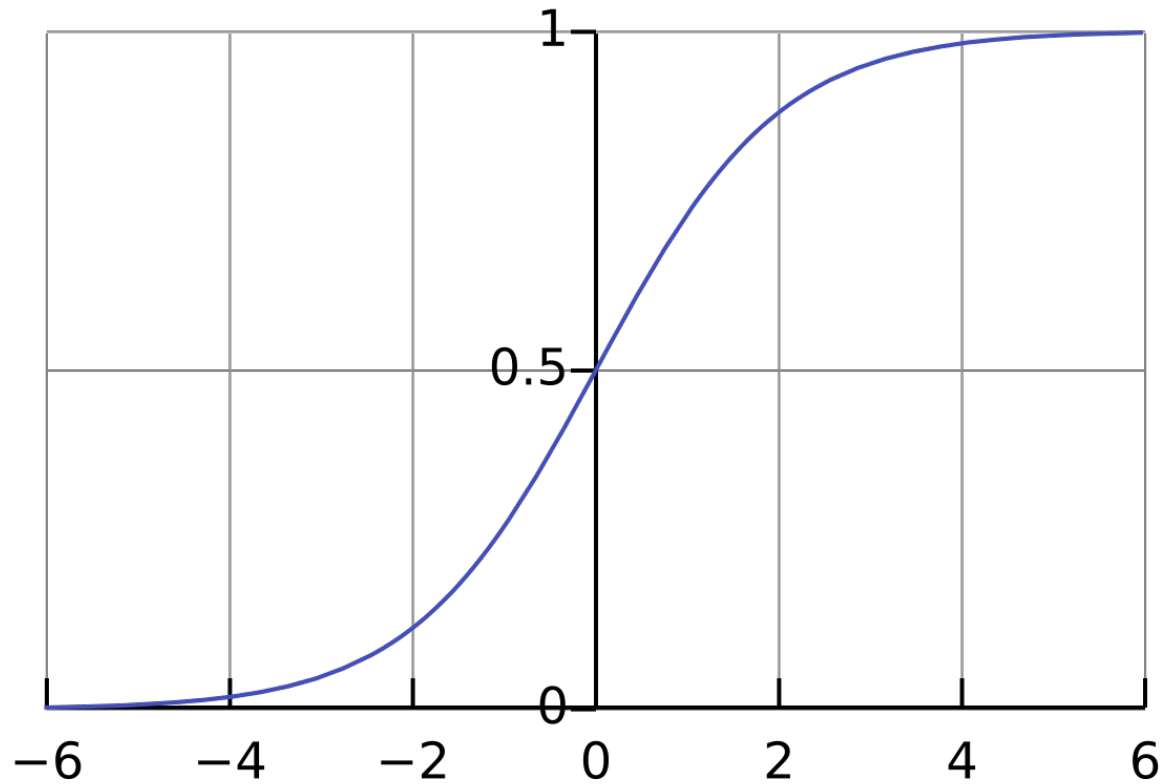
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The sigmoid function

$$S(x) = \frac{1}{1 + e^{-x}}$$

The sigmoid function



[Source](#)

**If you can do the forward pass by hand you've
understood neural networks...**

The forward pass by hand (house price prediction - a regression problem)

See whiteboard

Scaling outputs with the **softmax** function

$$s(x_i) = \frac{e^{x_i}}{\sum_{j=1}^n e^{x_j}}$$

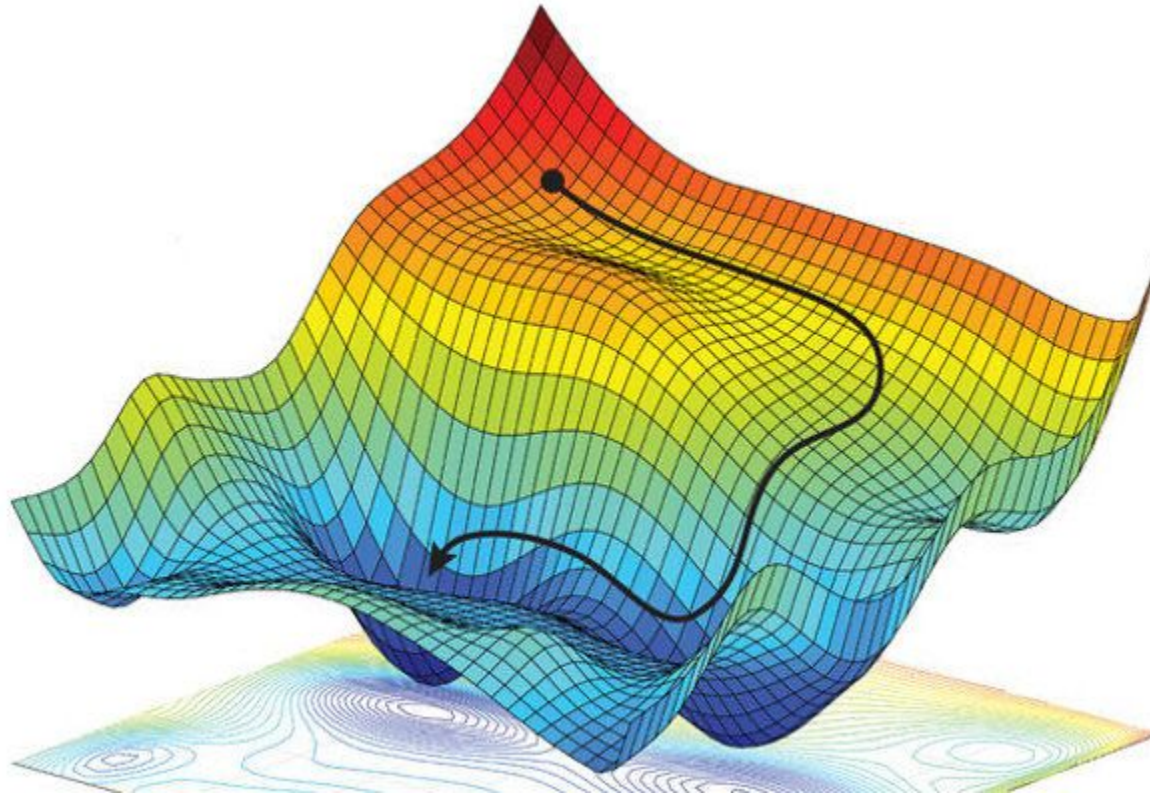
The forward pass by hand

(unwell or not unwell - a classification problem)

See whiteboard

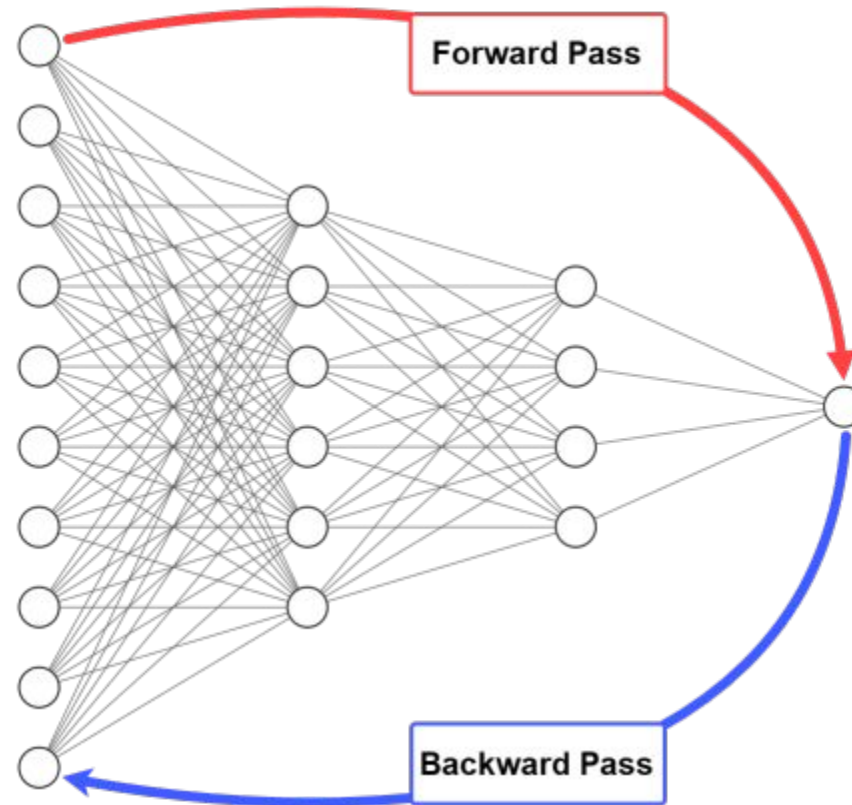
The Backward Pass and Gradient Descent

Gradient Descent Recap



[Source](#)

The backward pass

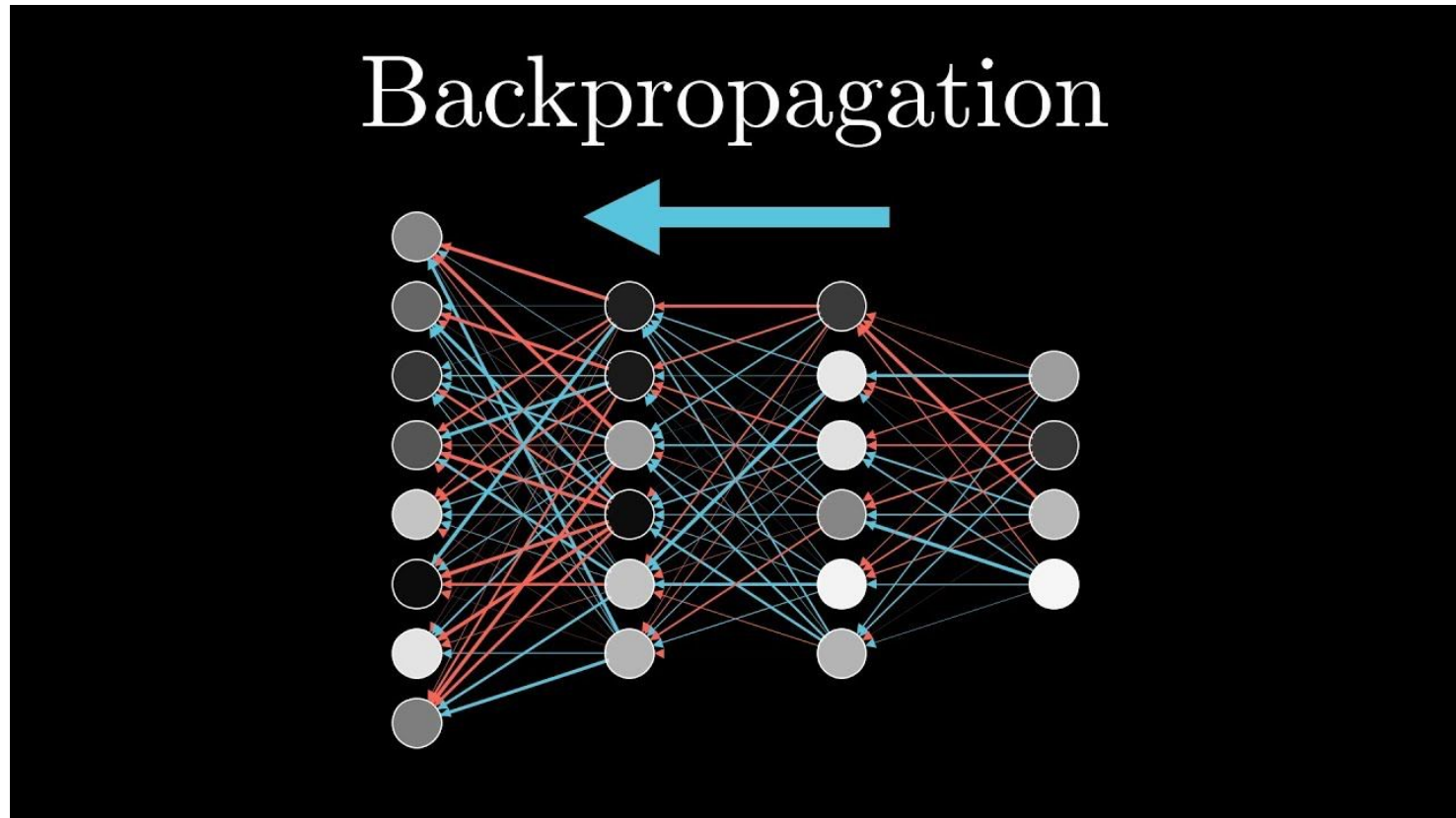


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Backpropagation



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Assignment Feedback

Discussion

[Extra]



Language model research task

