Car Racing AI workshop

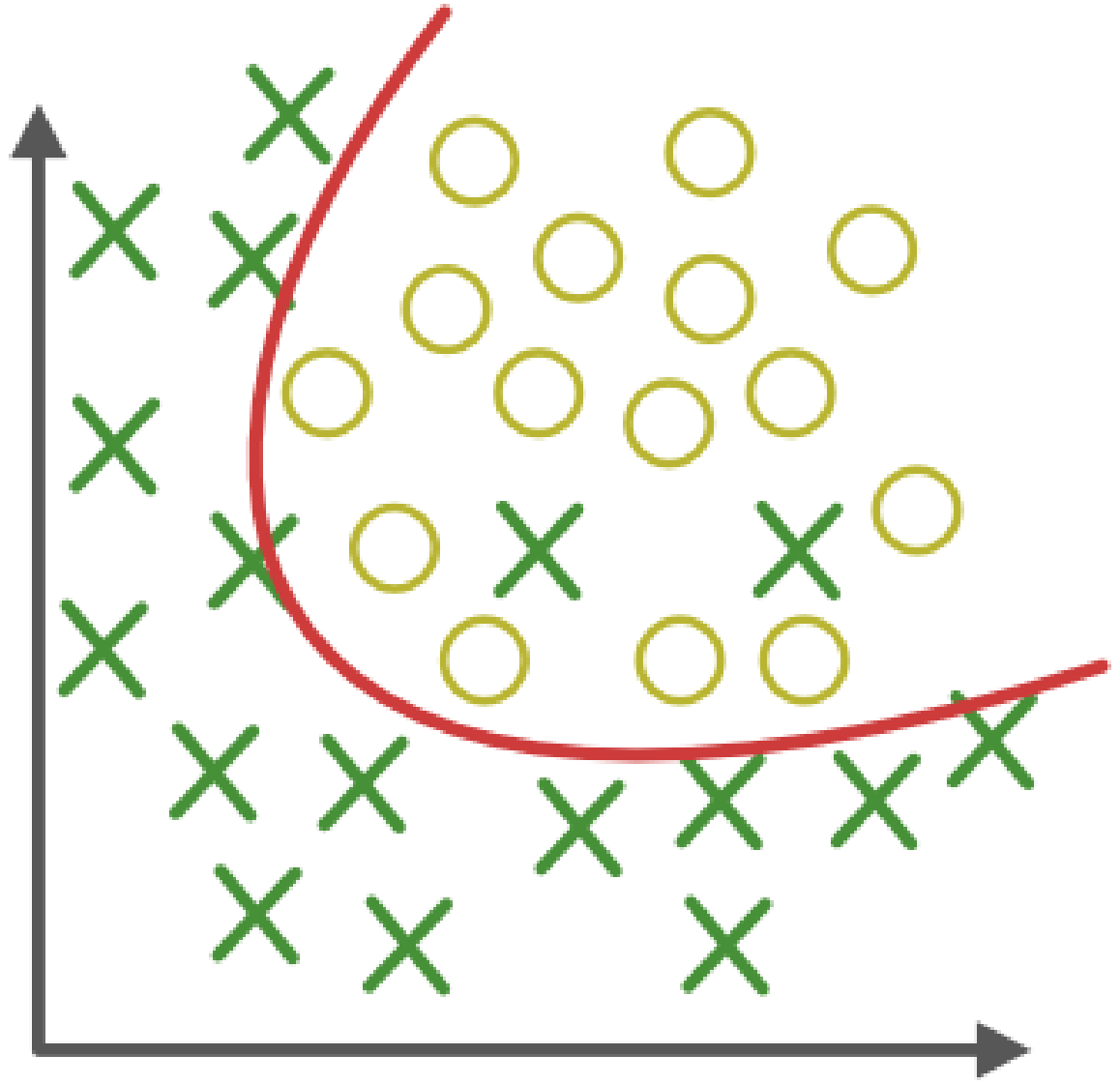
ITSC Summer Camp 2025

Types of AI??

Picking the brains of AI…

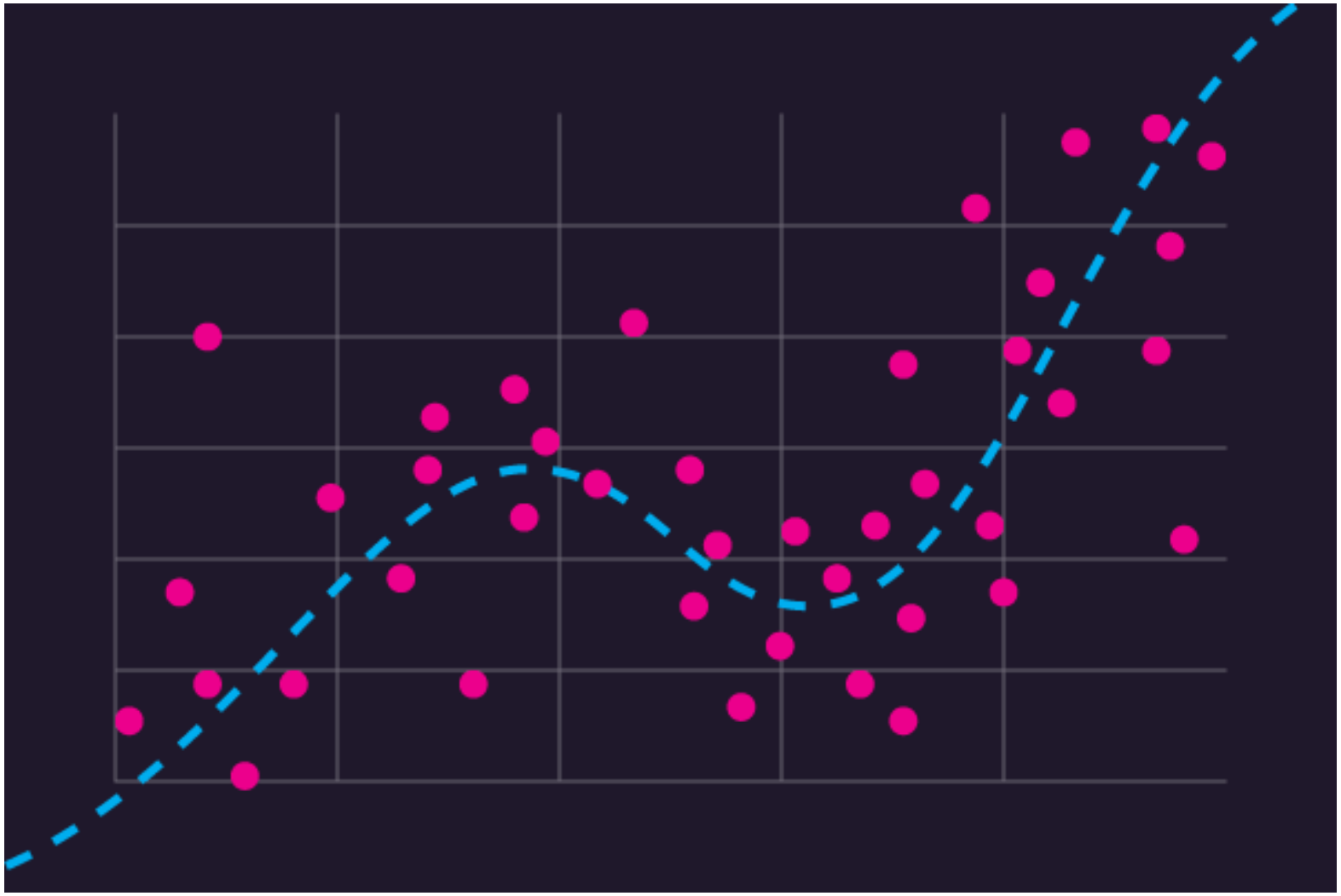
Classification Problem

Segregation of data points



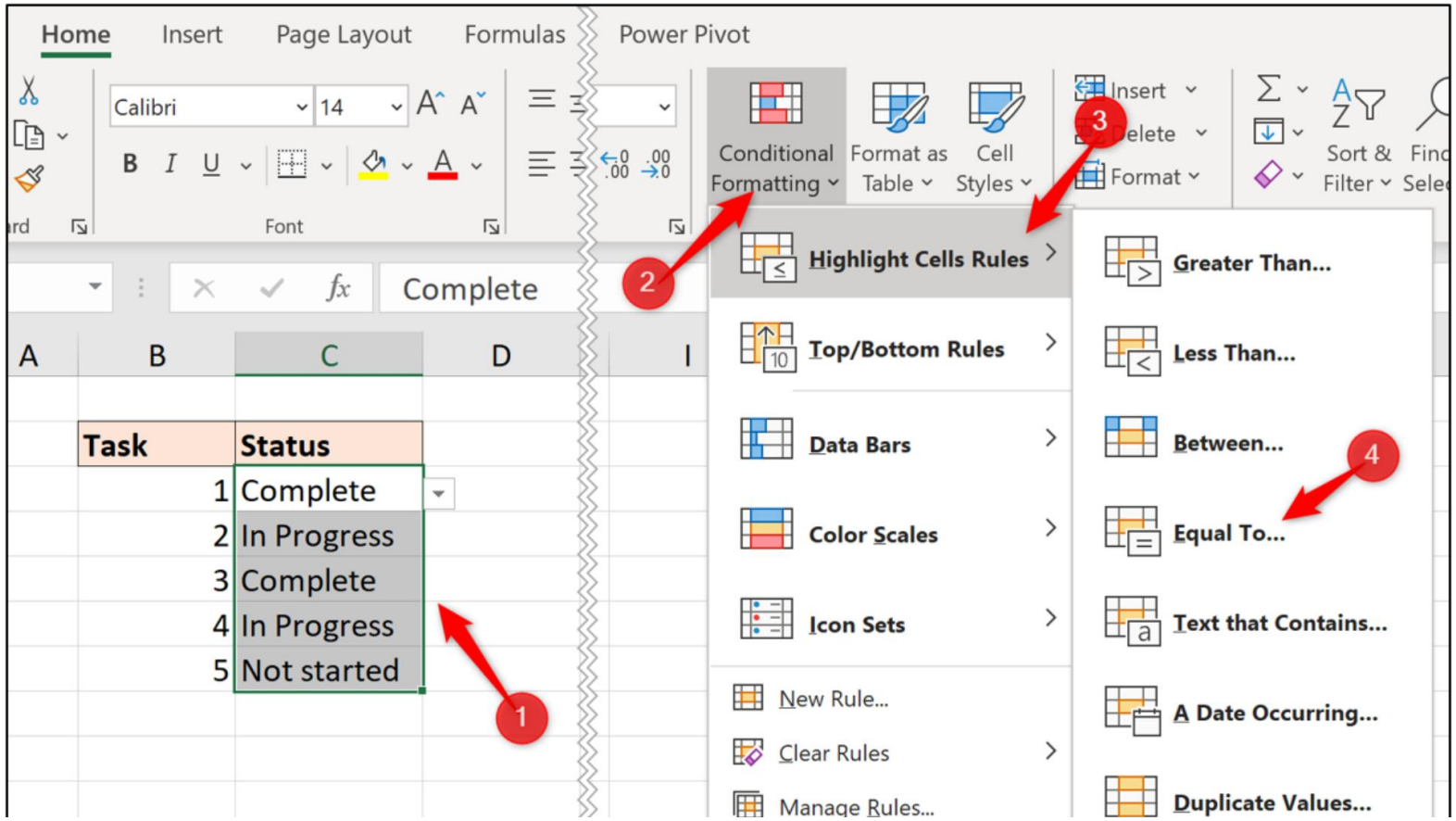
Regression

Generalisation of data points



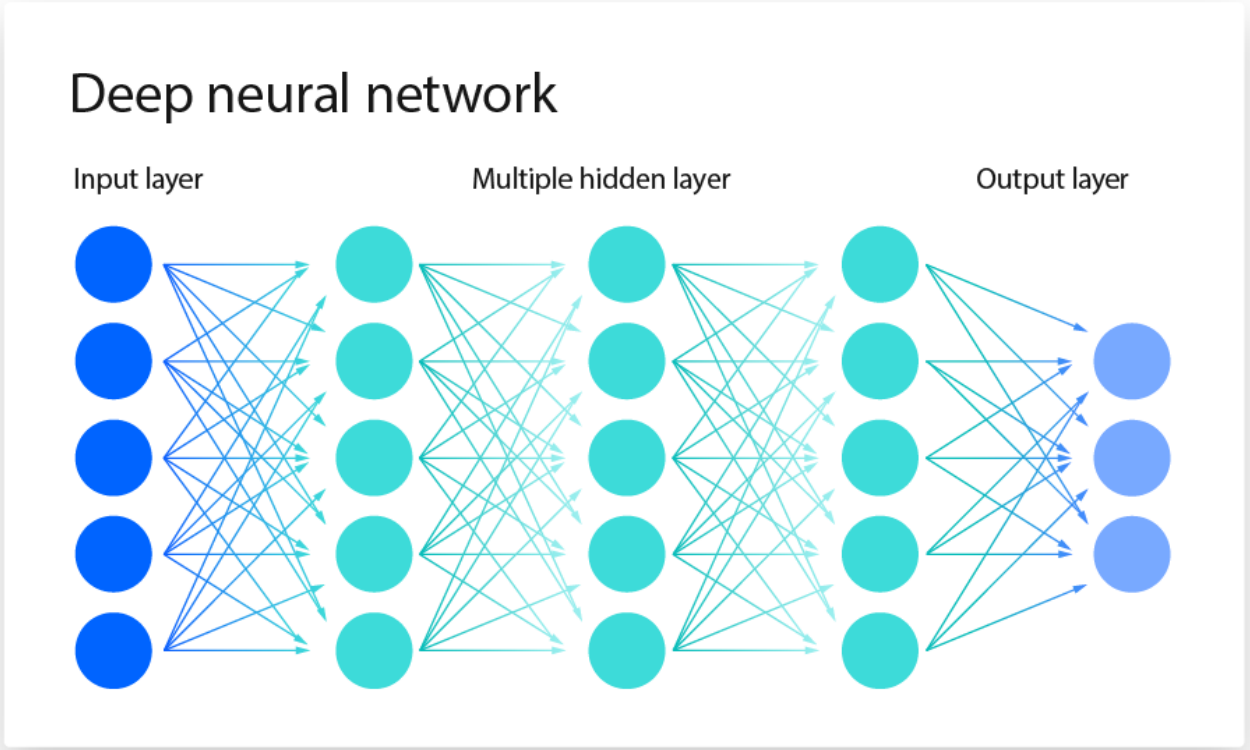
Rule-based System

Using human-made rules to create a result



Neural Network

Most versatile type of AI*



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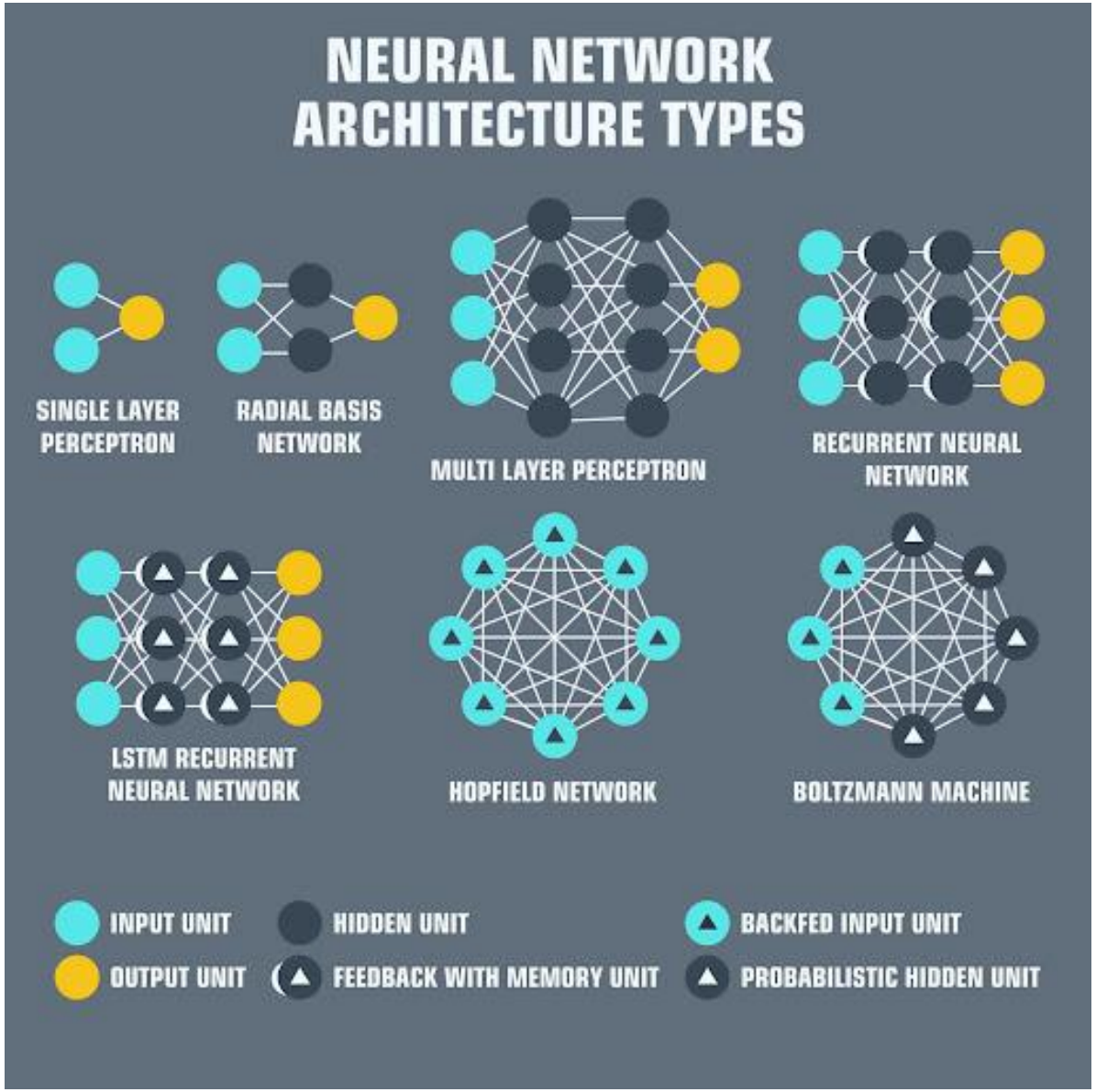
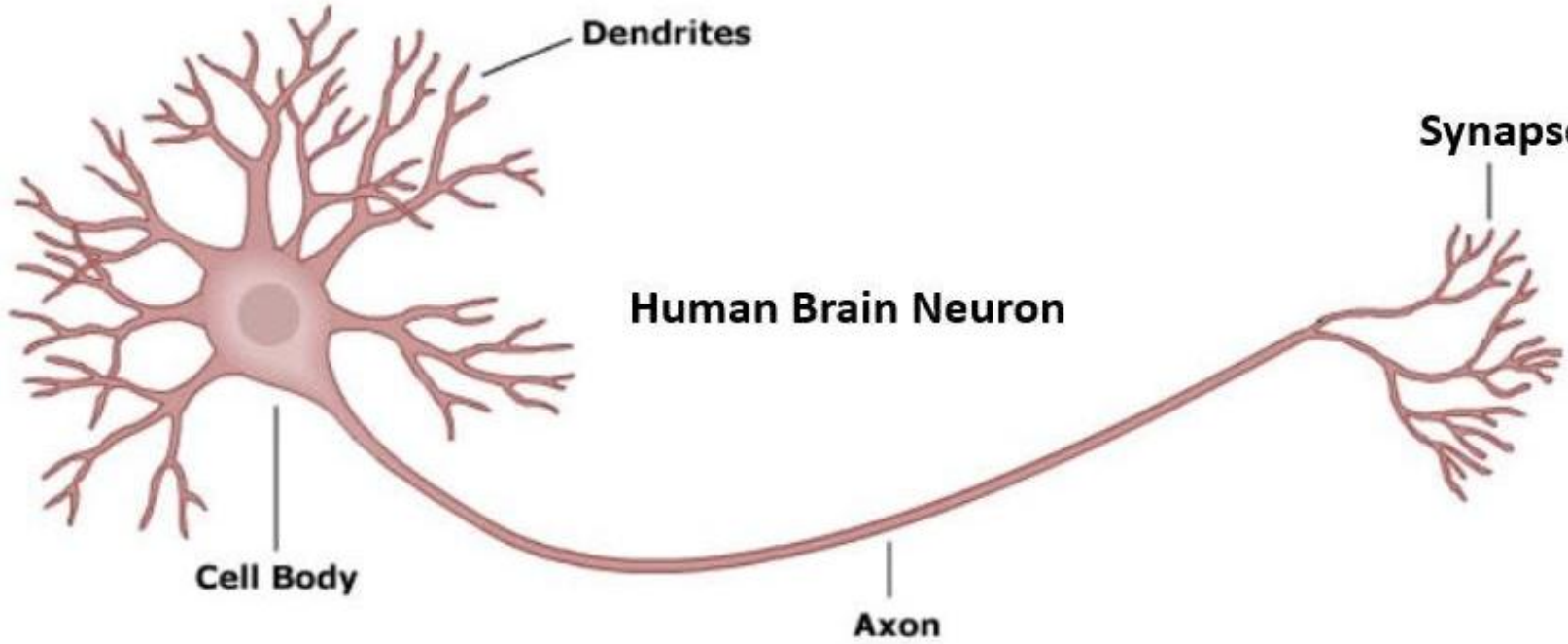
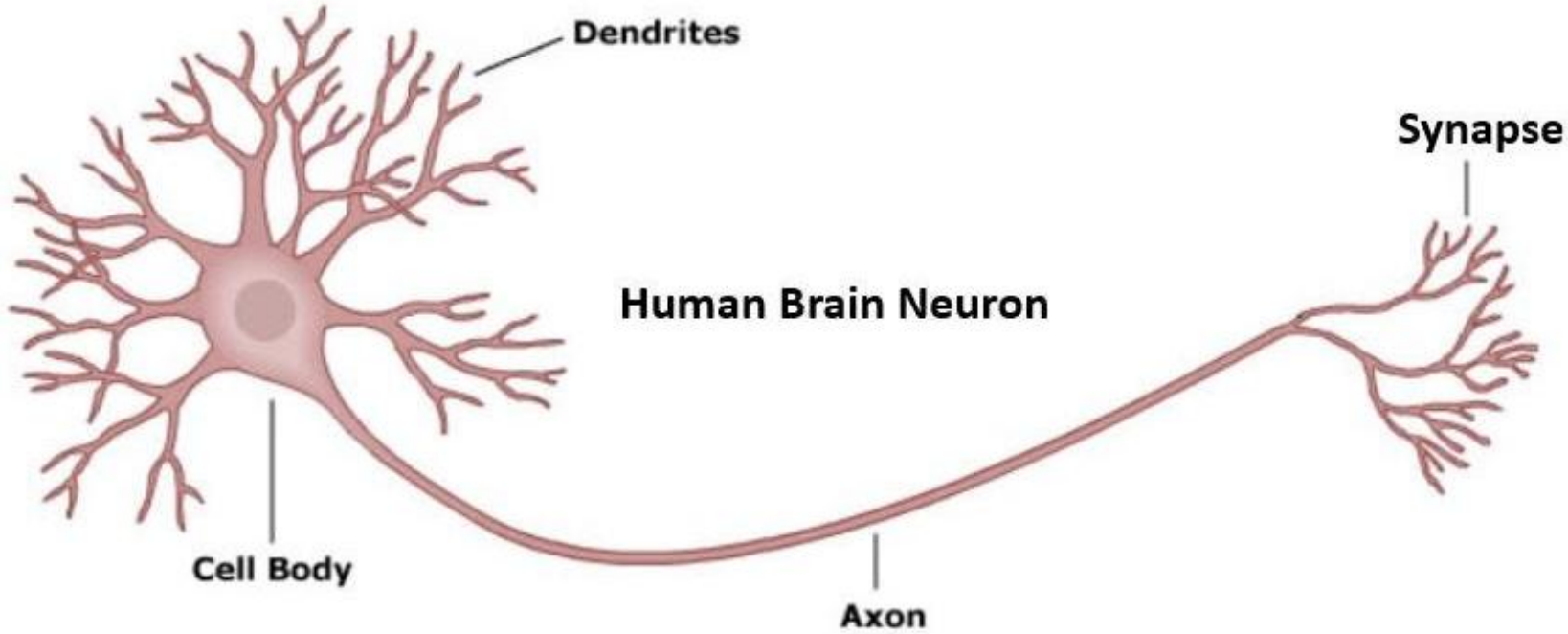
Most versatile type of AI*




Dendrites
Synapse
Human Brain Neuron
Cell Body
Axon


Dendrites
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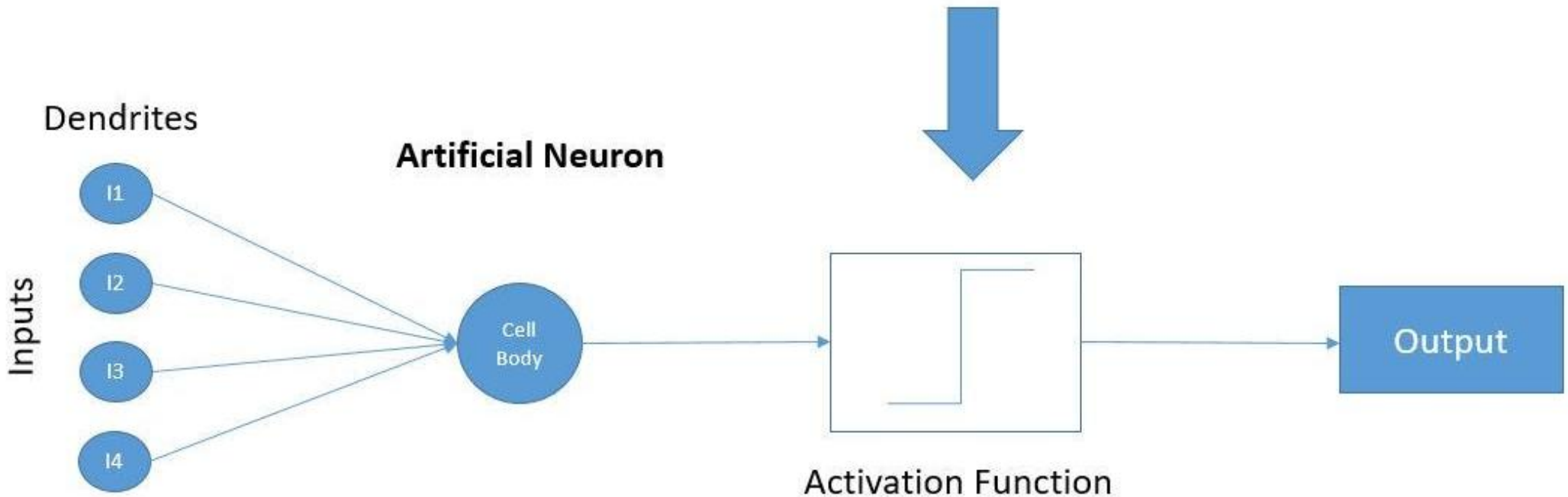
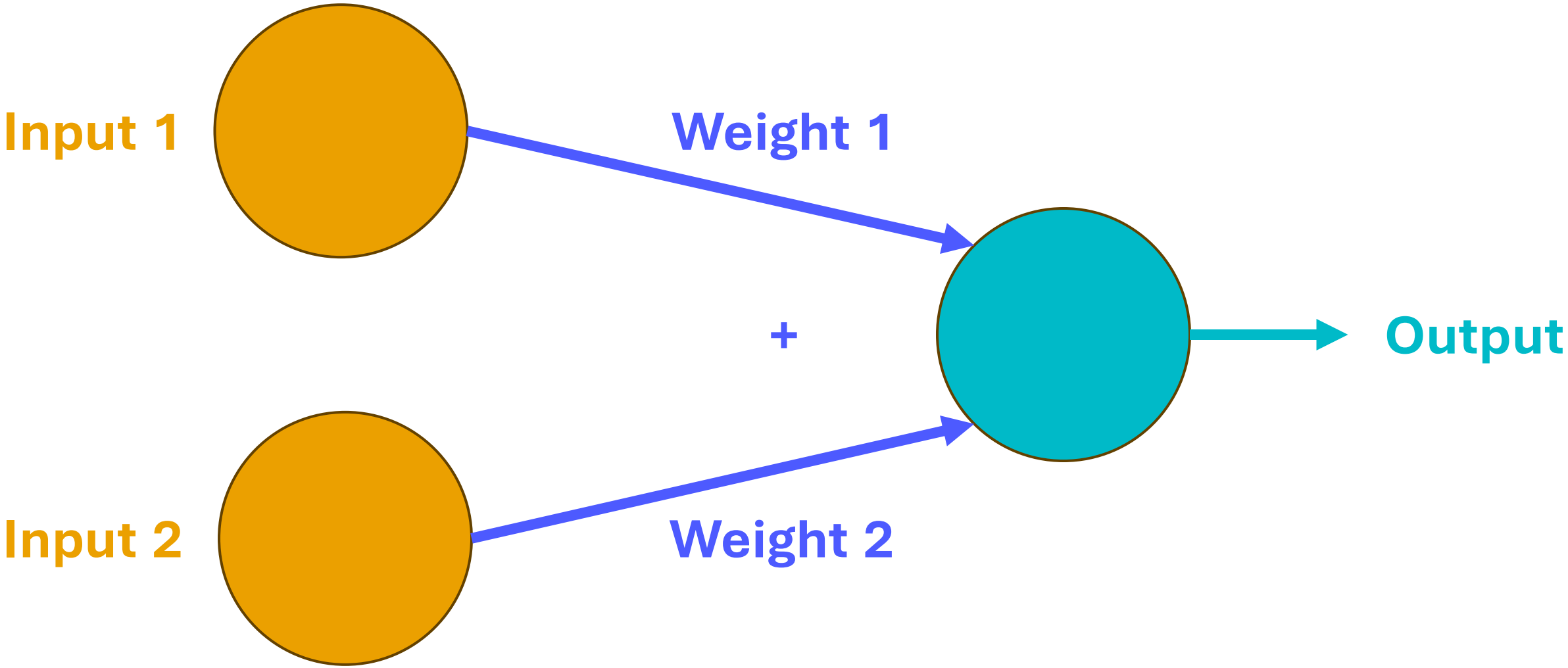
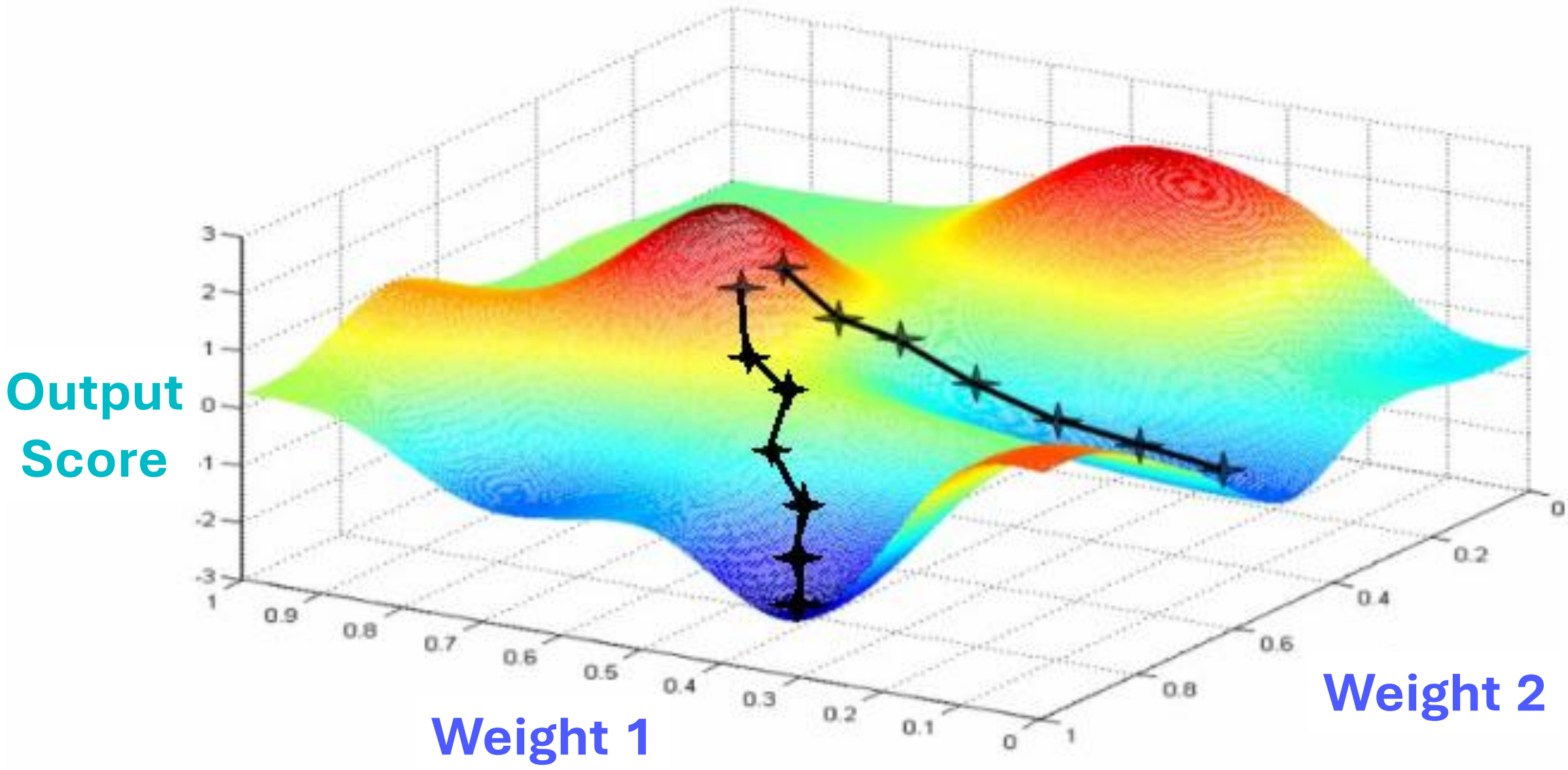
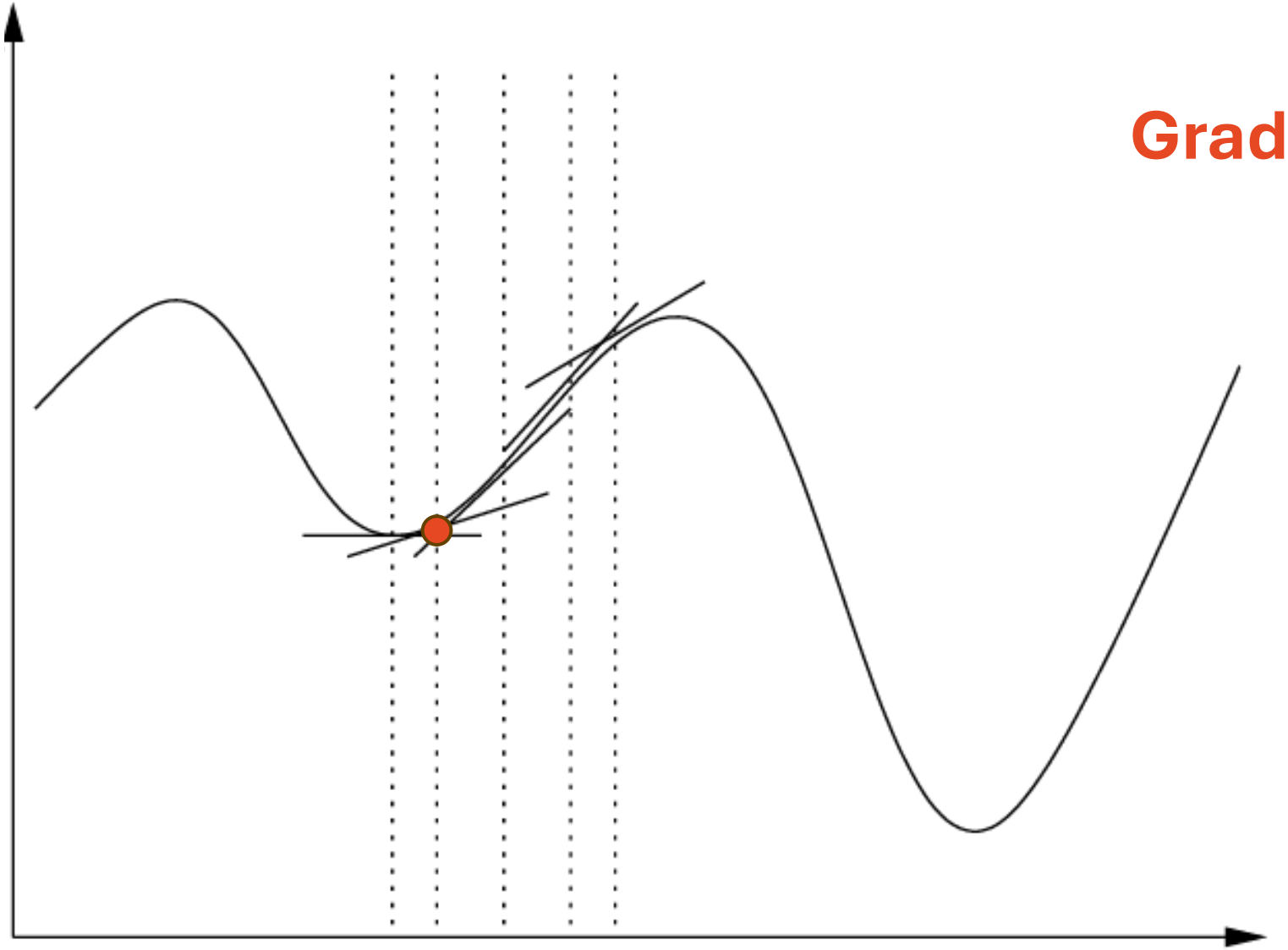

Dendrites
Artificial Neuron
I1
I2
I3
I4
Inputs
Cell Body
Output
Activation Function


Input 1
Weight 1
+
Output
Input 2
Weight 2


Output Score
3
2
1
0
-1
-2
-3
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Weight 1
0
0.2
0.4
0.6
0.8
1
Weight 2

Output
Score

2D hill
Gradient ascent



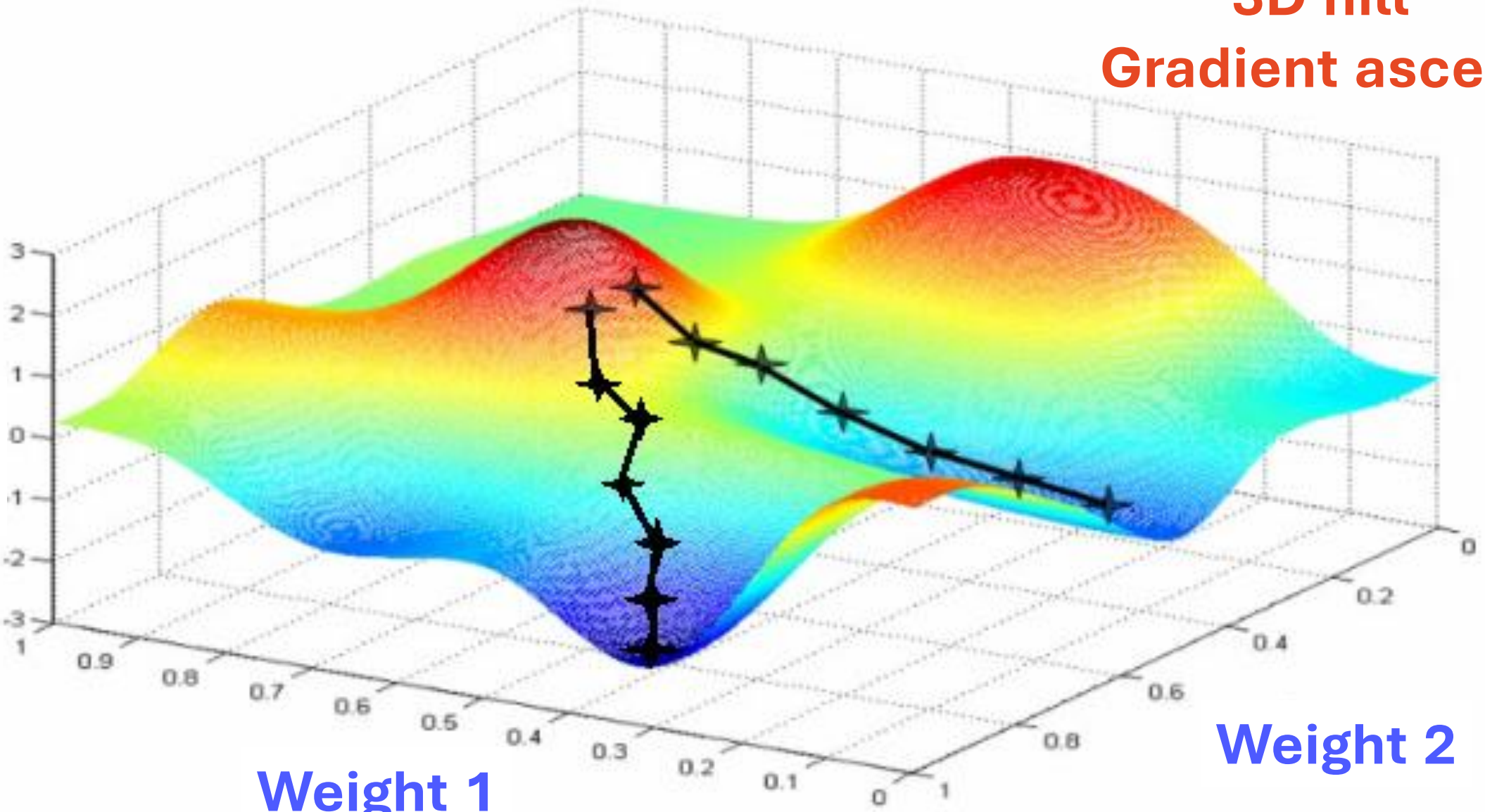
Weight 1

×1

3D hill
Gradient ascent

Output
Score

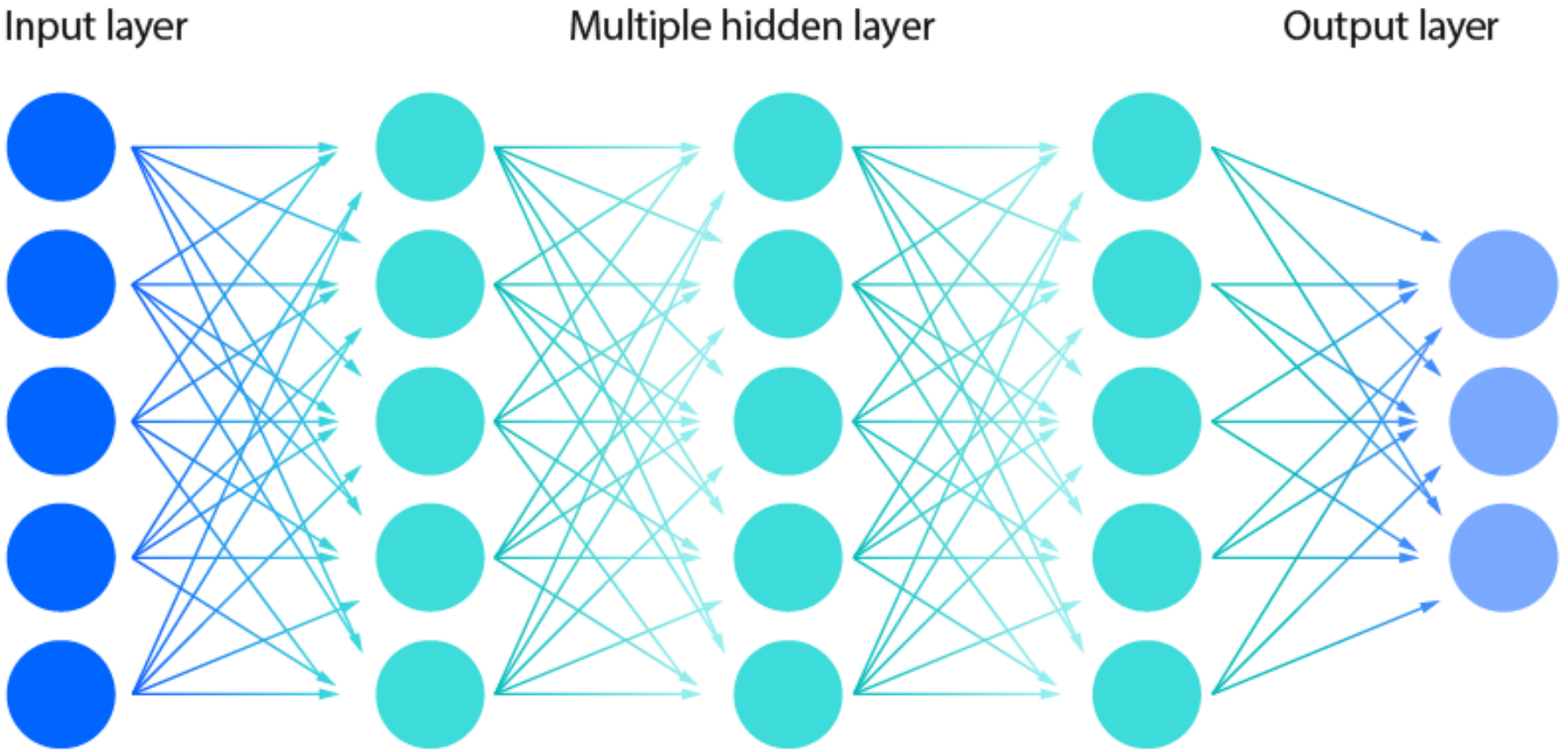
×2



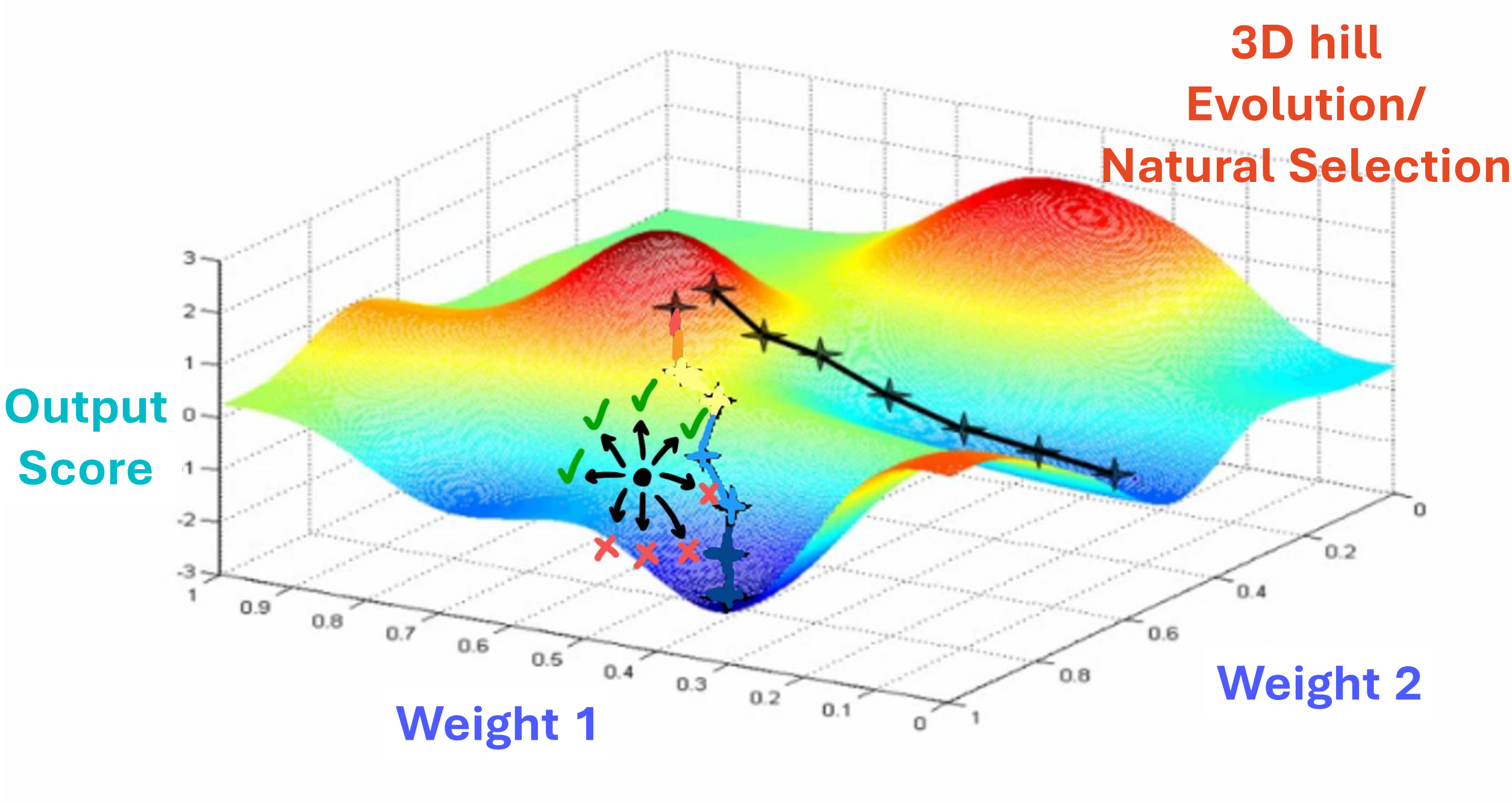
Weight 1

Weight 2

Deep neural network



×90


3D hill
Evolution/
Natural Selection
Output
Score
Weight 1
Weight 2
3
2
1
0
-1
-2
-3
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1

GradAsc

- *Guaranteed to reach a maximum (hilltop)*
- *Explore every dimension*
- *Slow with big network*

NatSel

- *Not guaranteed…*
- *Does not explore every dimension*
- *Same* speed regardless of network size*

I want to play car where is my car why are you talking so much what is wrong with you

cck.wtf/racing-ai

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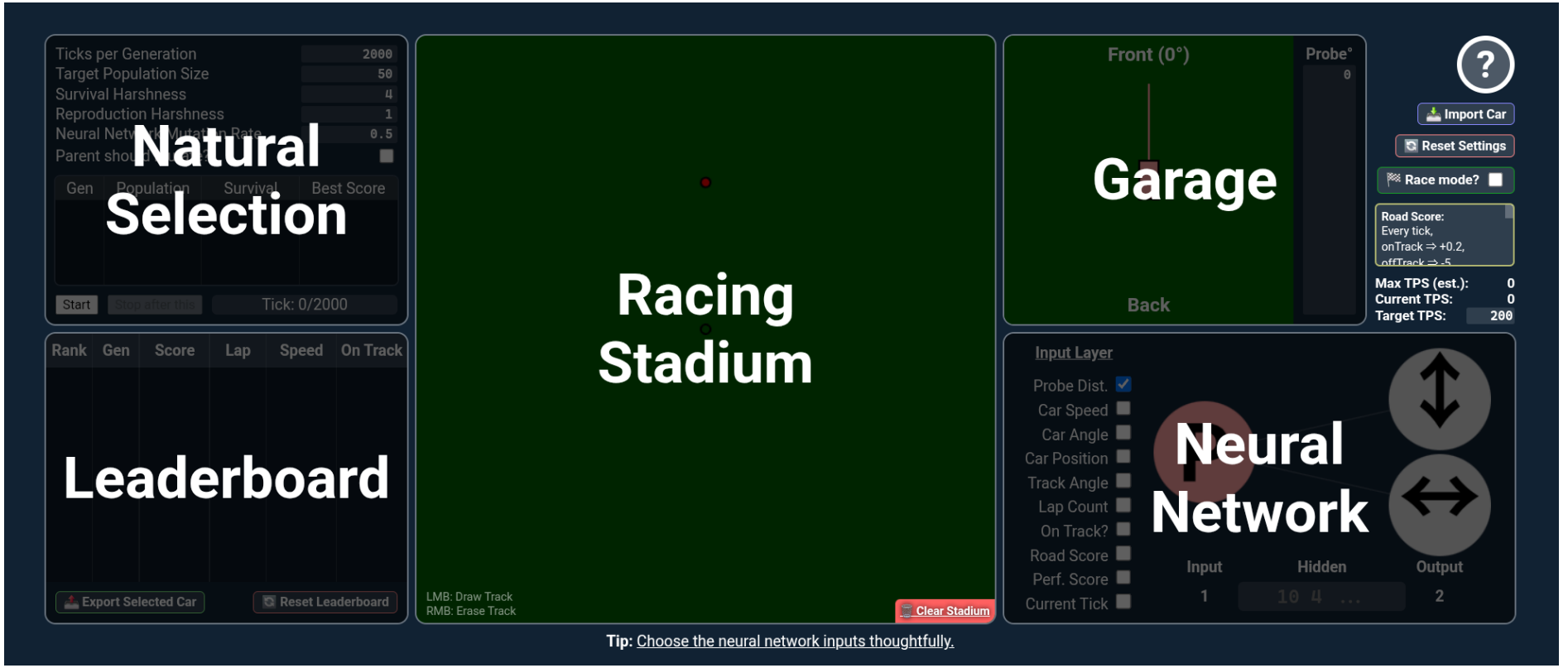

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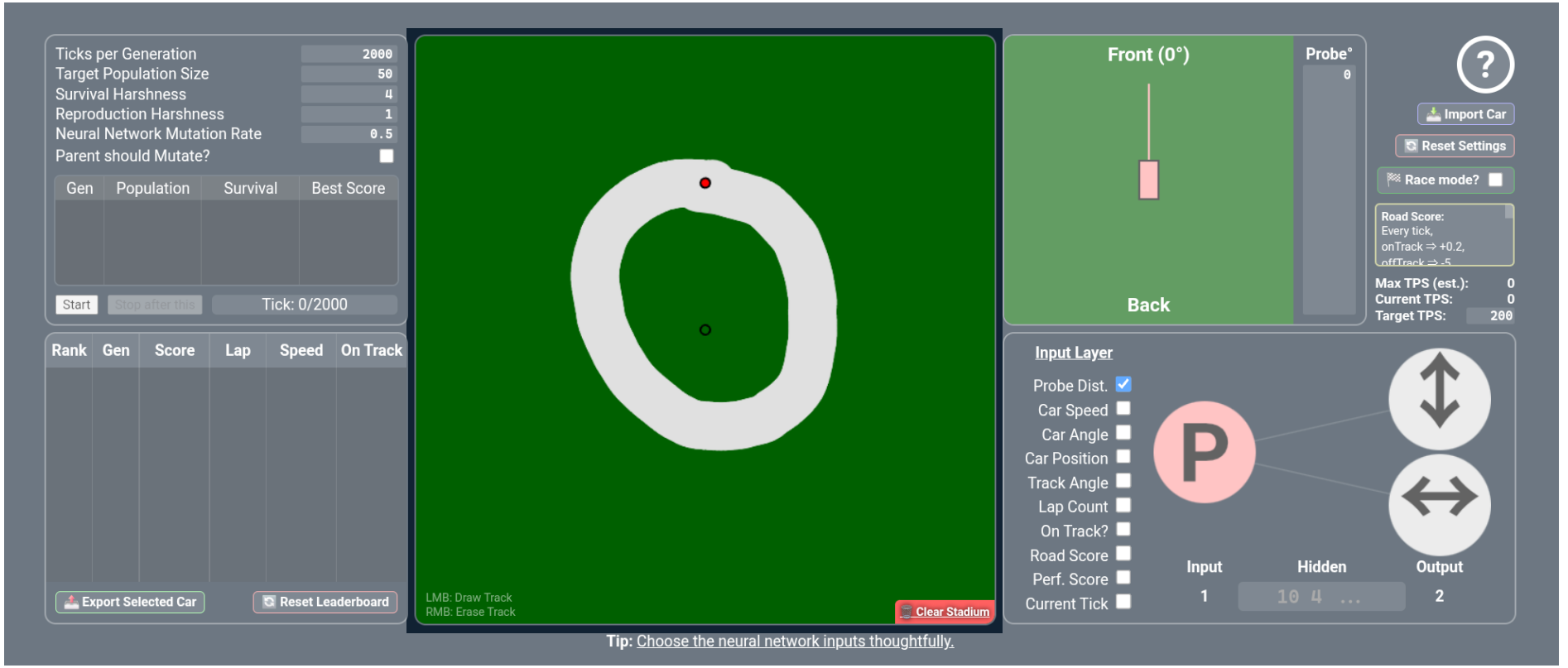

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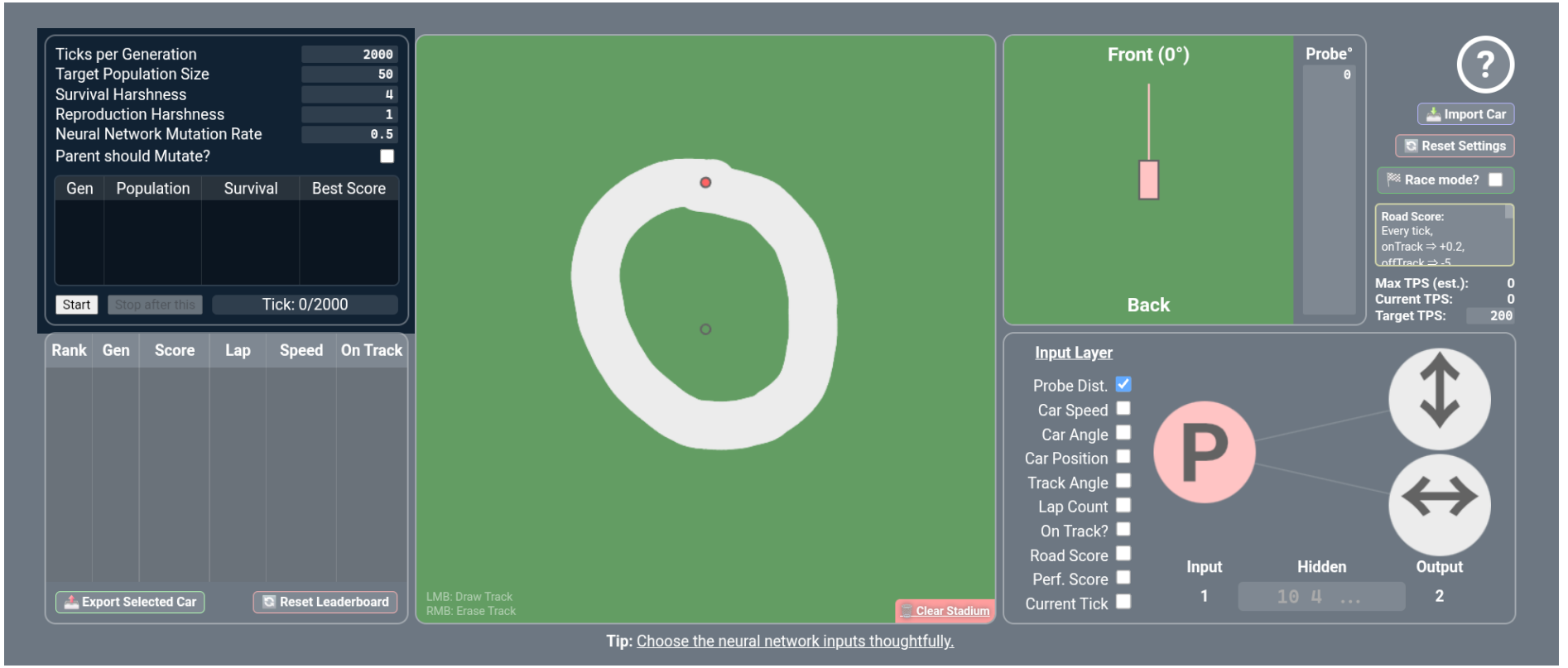

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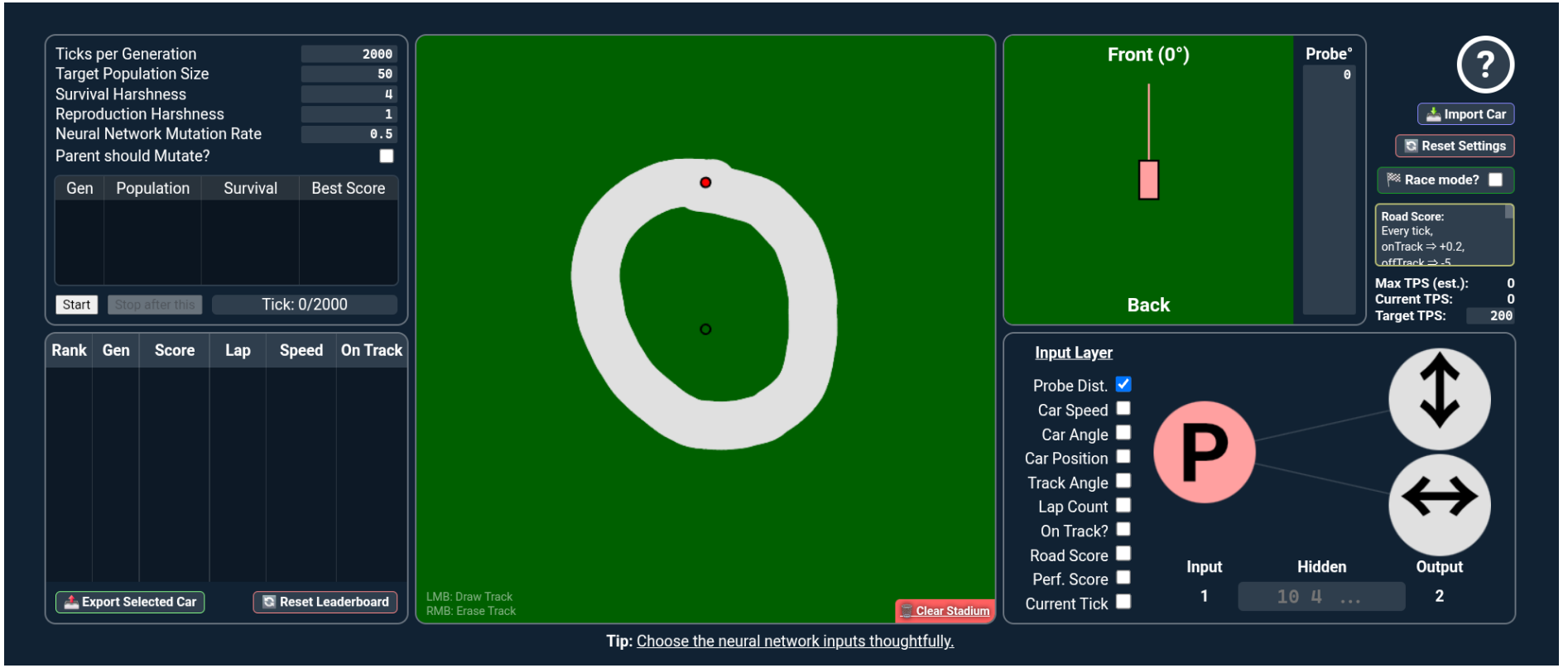

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