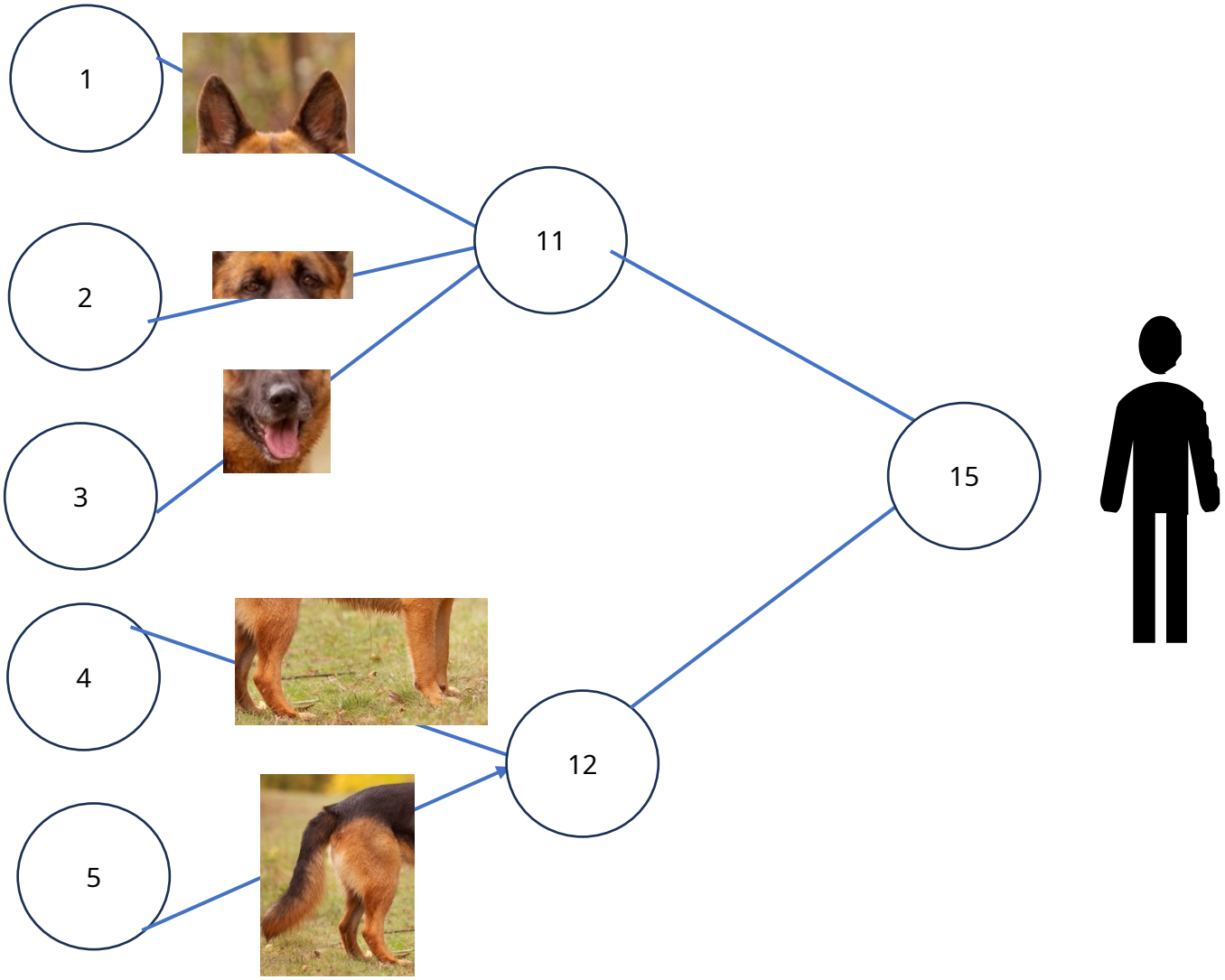

Neural Network — The Simplest Explanation

Understanding Neural Networks, Forward Propagation, and Backpropagation

🧠 The Big Idea

A neural network does not recognize things all at once.

It understands by combining many small signals step by step. No single neuron knows what a dog is — **understanding comes from teamwork.**

👀 Step 1: Tiny Helpers (Neurons)

Each neuron looks for only one small thing:

- Eyes
- Ears
- Nose

Each neuron gives a score between **0 and 1** saying how strongly it sees that feature.

```
Eyes = 0.8
Nose = 0.9
Ears = 0.6
```

🧩 Step 2: Making Bigger Ideas

Another neuron combines these scores to decide if there is a face. Some features matter more, so they are given more importance (weights).

```
Face = eyes × 0.2 + nose × 0.2 + ears × 0.5 = 0.79
```

➡️ Step 3: Forward Propagation (Making a Guess)

Information flows forward through the network:

image → features → face → dog probability

This forward flow is called **forward propagation**. At the end, the network makes a guess like: "*This is a dog with 0.79 confidence.*"

❌ Step 4: Checking the Mistake

The network compares its guess with the correct answer and measures how wrong it was.

This difference is called **error (or loss)**.

⬅️ Step 5: Backpropagation (Learning)

The network now goes backward and fixes itself:

- Maybe ears mattered too much
- Maybe eyes should matter more

It slightly adjusts the importance values (weights).

This backward correction is called **backpropagation**.

Learning Loop:
Forward → Guess
Check → Error
Backward → Fix weights
Repeat until the network improves