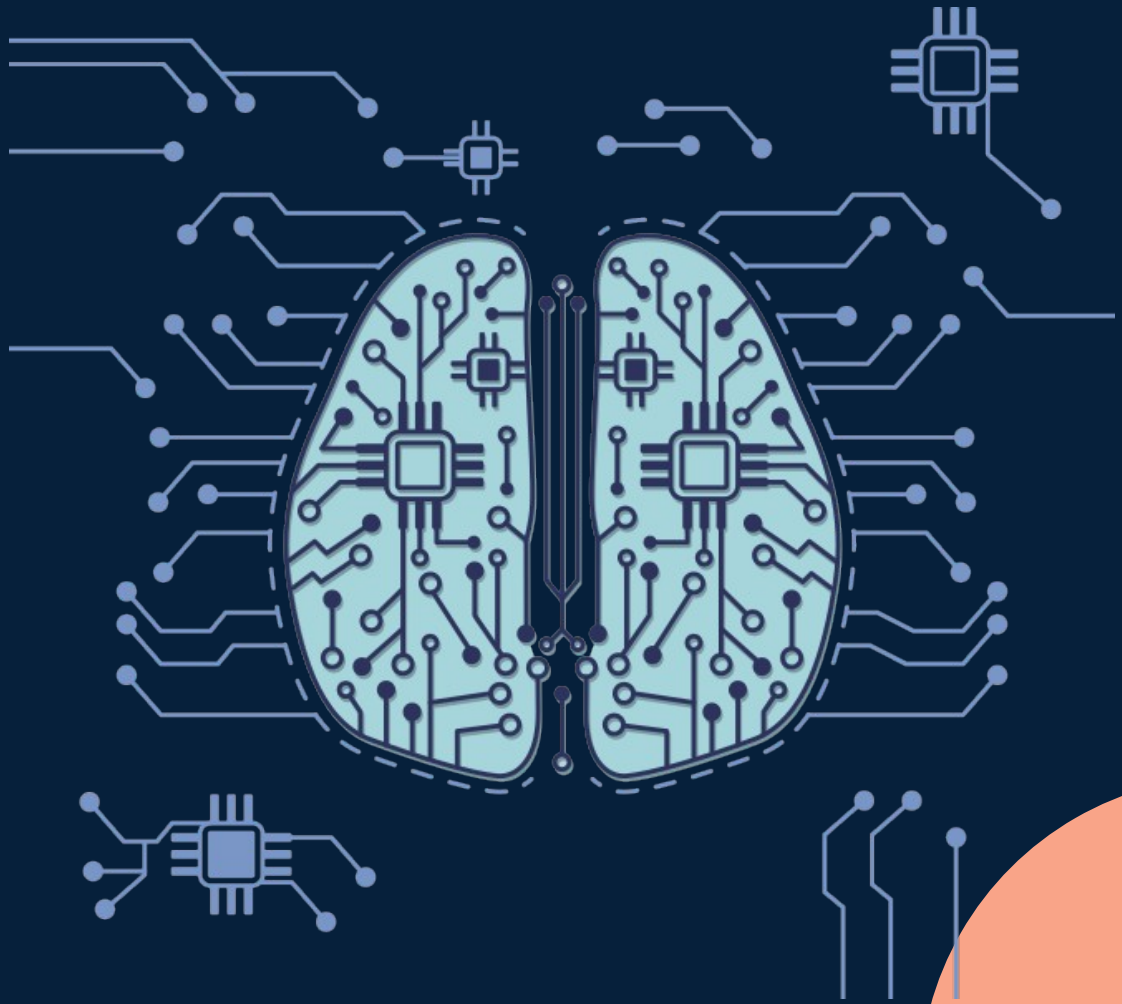
PoseNet 2Scratch



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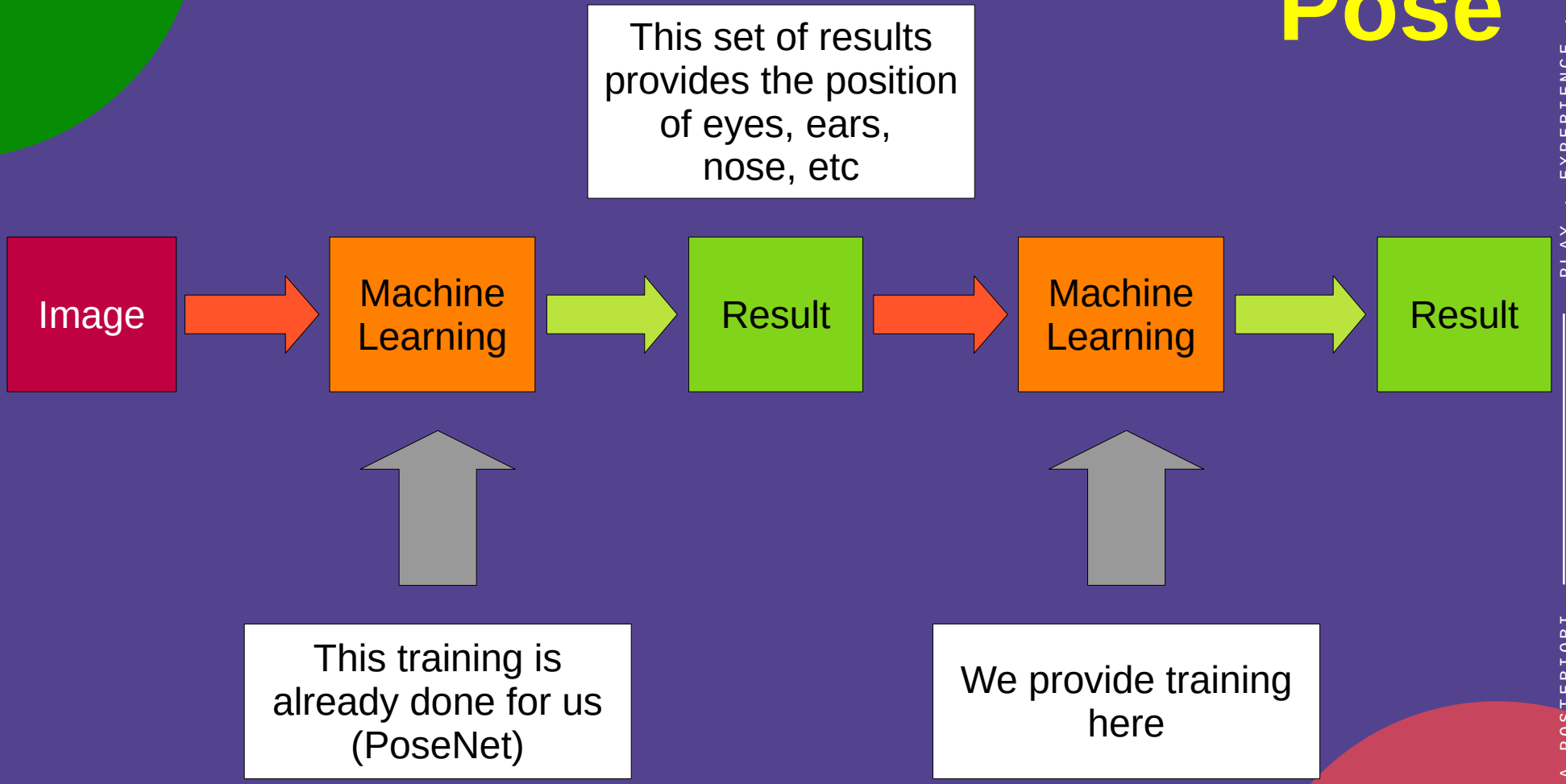
PoseNet

- We’ve used this in the Pose Model!
- ...but here we’ll be using it directly
- Unlike the previous exercises, we won’t need to train the model; it is already trained for us

How it works?

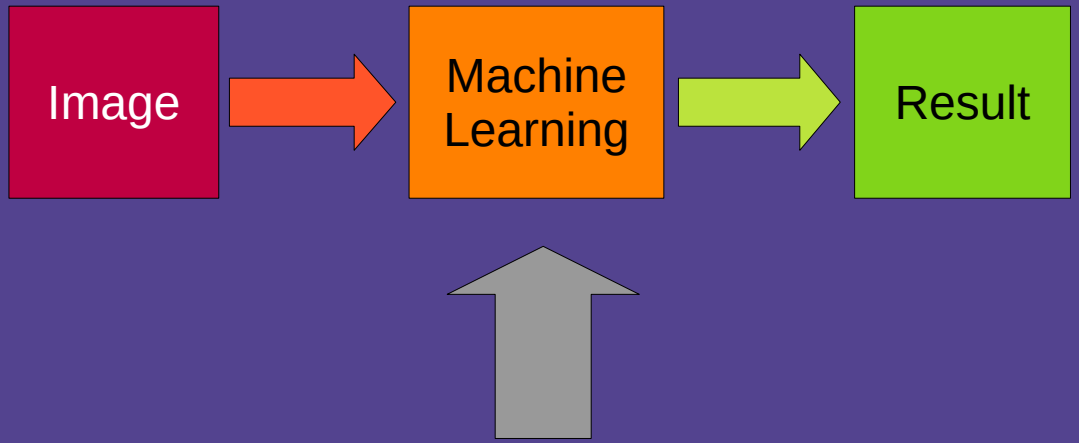
- Different from the rest
  - Training is already done
  - Trained on a large amount of high quality data
  - Can recognise various body parts with good accuracy

Pose



PoseNet

This set of results provides the position of eyes, ears, nose, etc



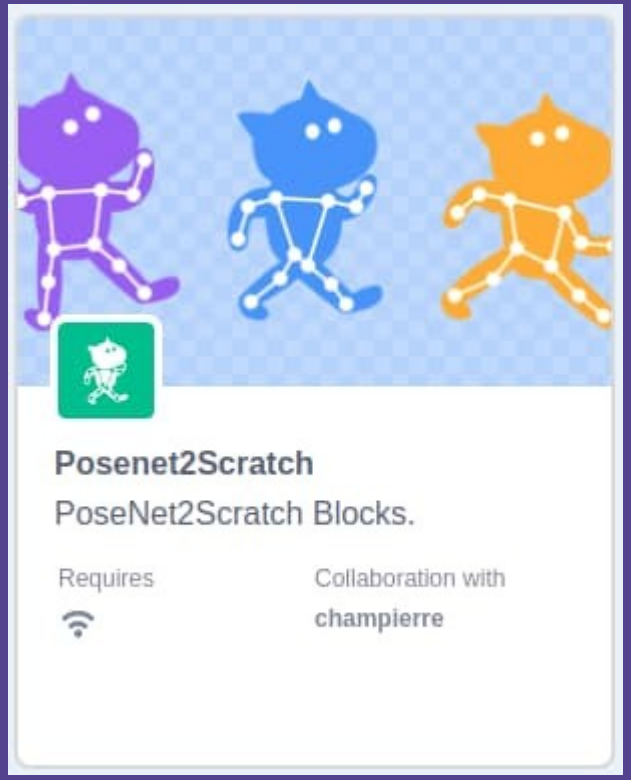
Directly use the results from PoseNet

This training is already done for us (PoseNet)

Teachable Machine

No Need!

Adding the Extension



- Open https://stretch3.github.io/
- Add the “Posenet2Scratch” extension
- IMPORTANT! You should not have any teachable machine extensions at the same time

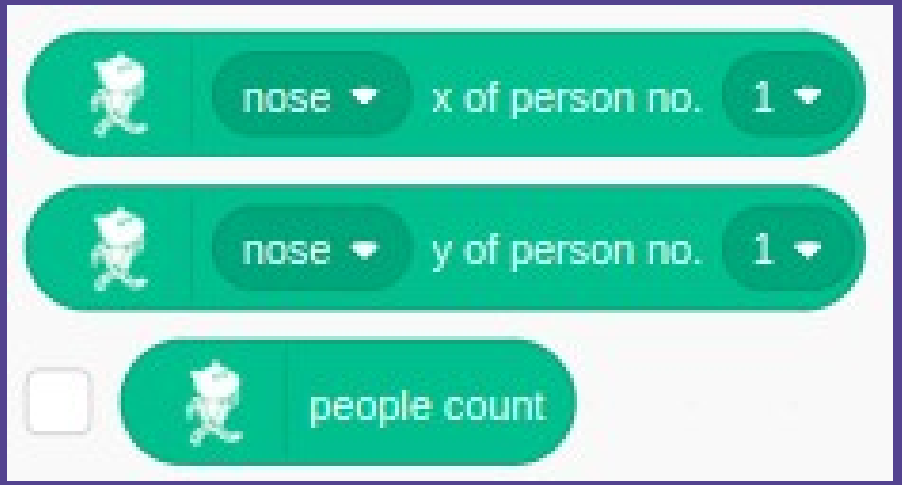
Using the Extension

- No need to load the model URL
- No “classes”
- Directly get the x and y position of each body part

Using the Extension

- Detected parts are...
  - Nose
  - Left / Right Eye
  - Left / Right Ear
  - Left / Right Shoulder
  - Left / Right Elbow
  - Left / Right Wrist
  - Left / Right Hip
  - Left / Right Knee
  - Left / Right Ankle

Using the Extension



- Can count number of people on screen
- Can detect body parts of multiple people simultaneously

Challenge 1

- Place an apple (...or any other objects) over each eye
- The apple should follow the eye when you move your head

Problem (Size)

- Size of apple doesn’t change when you move closer or further from the camera
- How to detect distance from camera?

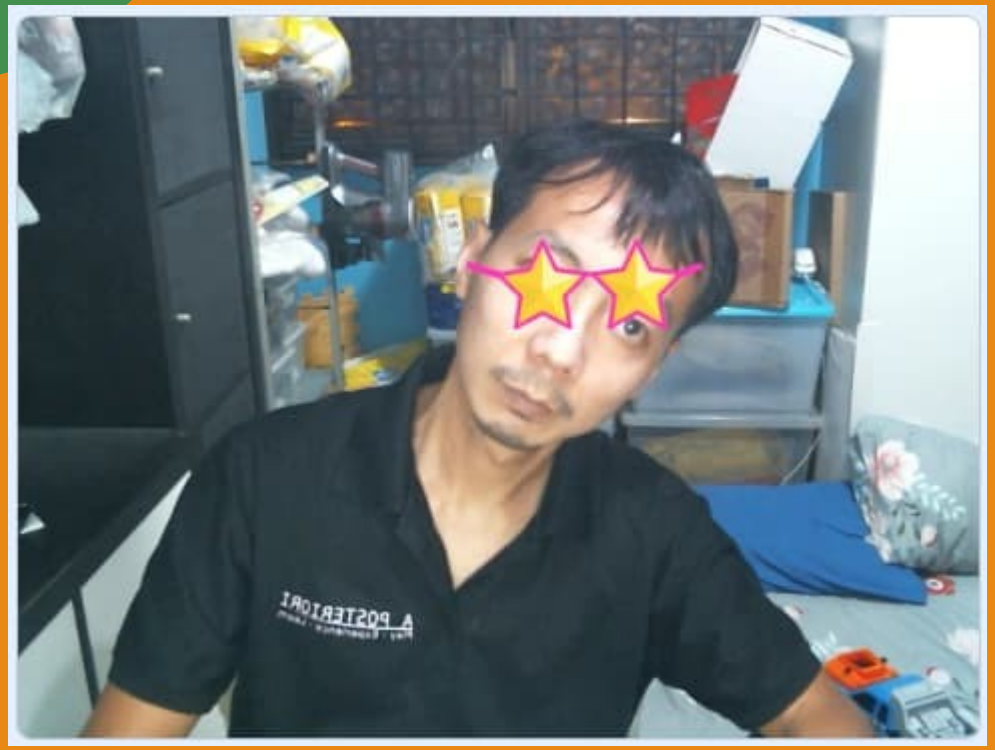
Solution (Size)

- Measure distance between two eyes
- Using either Pythagoras theorem or “distance to” block
- Scale the apple in proportion to the distance

Challenge 2

- Instead of two apples, place a pair of glasses over the eyes
- As before, it should follow the eyes and change its size to fit

Problem (Rotation)



- When you tilt your head, the glasses do not rotate
- How to determine what angle to rotate the glasses to?

Solution (Rotation)

- Find the direction from the left eye to the right eye
- You can do this using trigonometry, or using the “point towards” block

Challenge 3

- Place one pair of glasses on each person in view
- You can use clones for this

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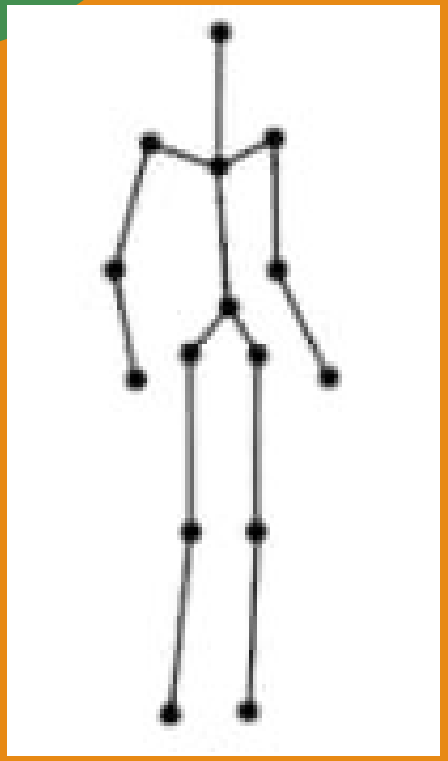
Problems (Various)

- You can’t easily use “distance to” and “point towards” to determine distance and angle
- Use Pythagoras theorem and trigonometry instead

- You should remove the excess clones when the extra people move out of view
- Assign each clone an ID using a “For this sprite only” variable
- Use the ID to identify which clone to remove

Challenge 4



- Create a stick figure or cartoon character that follows your entire body movement

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Challenge 5

- Use PoseNet to control a game
- Eg.
  - Detect head tilt using position of eyes
  - Move up or down based on distance to screen
  - Shoot when wrist is in view

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- Created by A Posteriori LLP
- Visit http://aposteriori.com.sg/ for more tips and tutorials
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- Some vector art created by freepik - www.freepik.com

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