

Coding & STEM 4 Schools

2019 AI Workshop

Training a Smart Assistant

Presented by Mr Daniel Hickmott on 12th November 2019

Machine Learning for Kids

- Free to use, although there can be some cost involved
- Non-commercial and all web-based
- Created and maintained by Dale Lane (Developer at IBM)
- Can use with Scratch, Python and AppInventor
- Important: the Scratch used within ML for Kids is not the 'real' Scratch



Teach a computer to play a game

Get started

Learn more

- 1 Collect examples of things you want to be able to recognise
- 2 Use the examples to train a computer to be able to recognise them
- 3 Make a game in Scratch that uses the computer's ability to recognise them

<https://machinelearningforkids.co.uk>

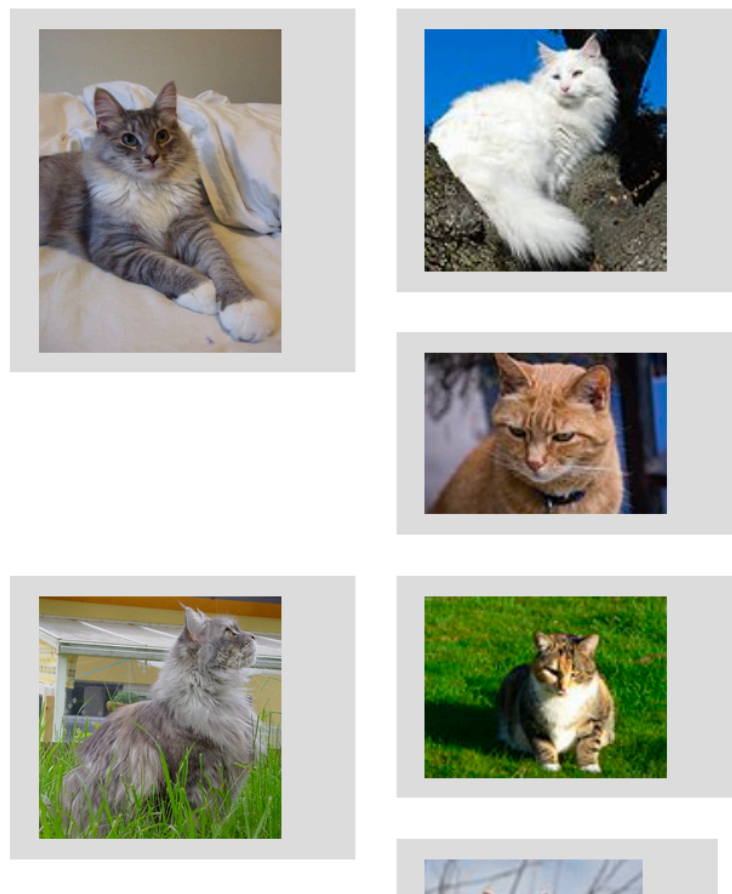
Using Machine Learning for Kids


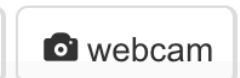
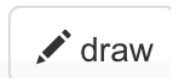
Usually involves three main steps:

1. We collect examples related to a problem/solution
2. We train a model by giving the computer examples split into different 'buckets', e.g. spam or not spam (supervised learning)
3. We use the model with code (e.g. Scratch blocks) to classify new data into these buckets

Training with Examples

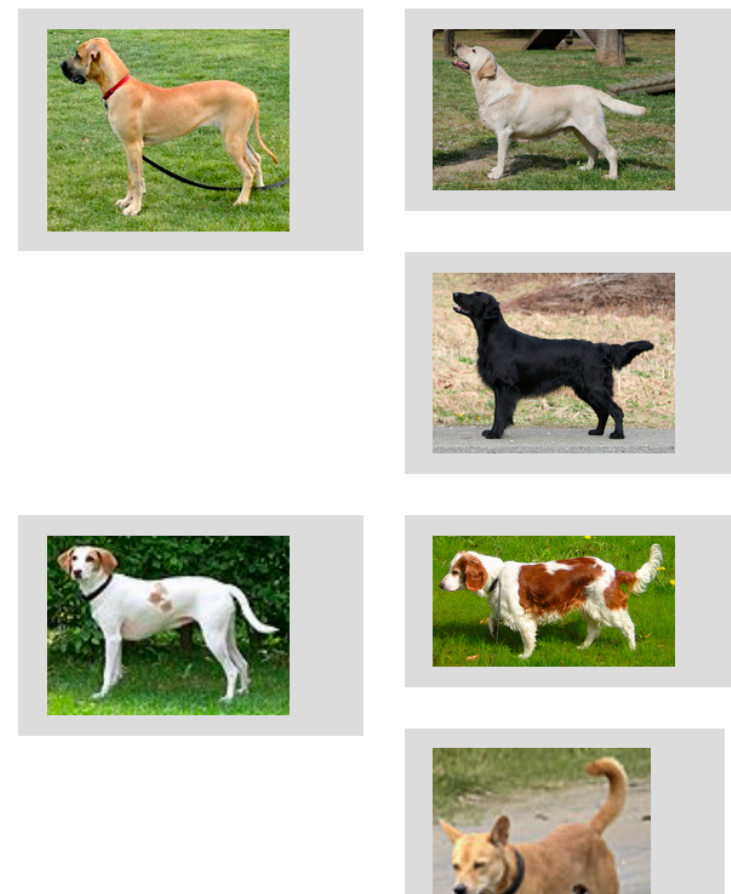
cat

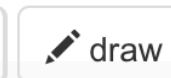


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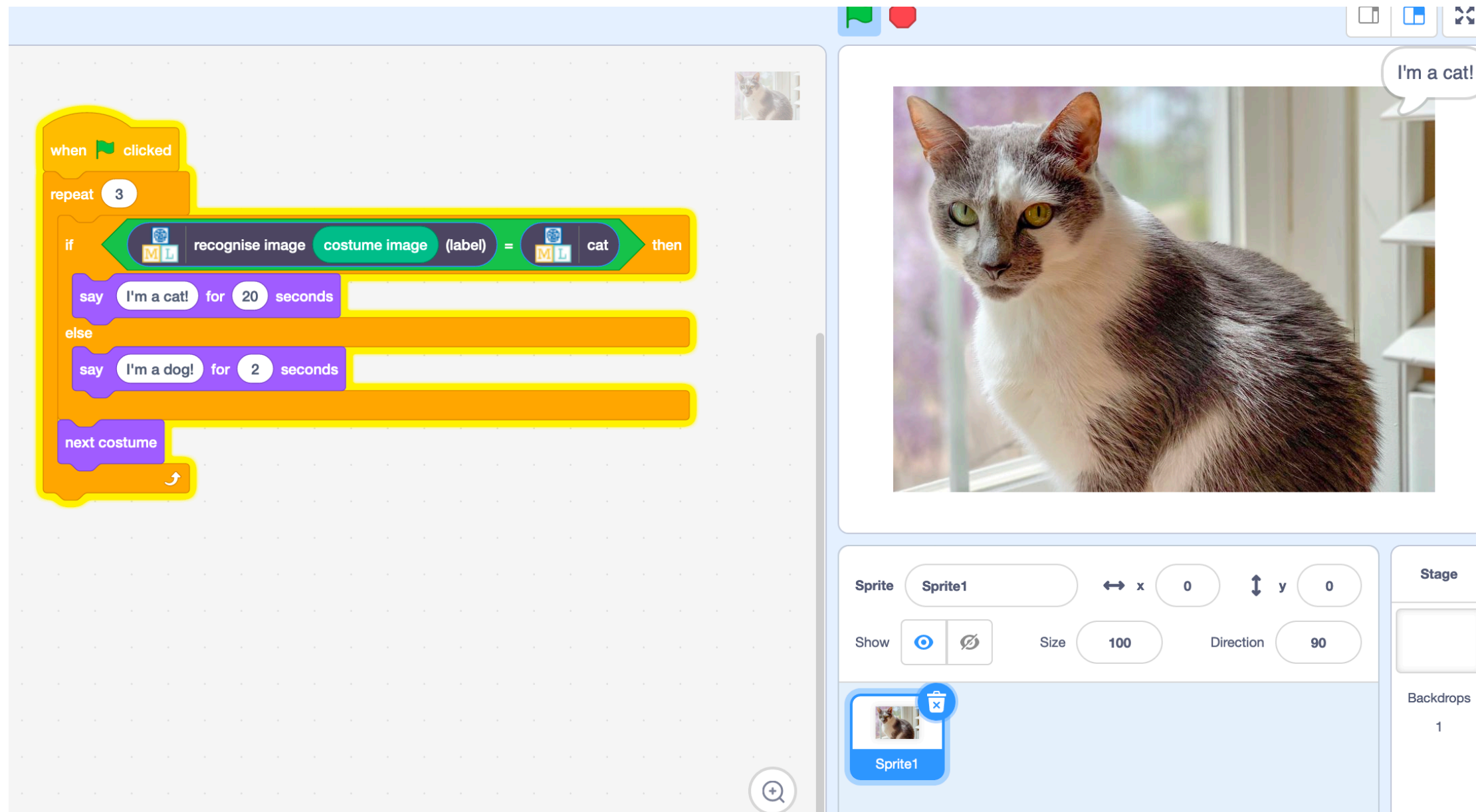
dog



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Coding with the Model

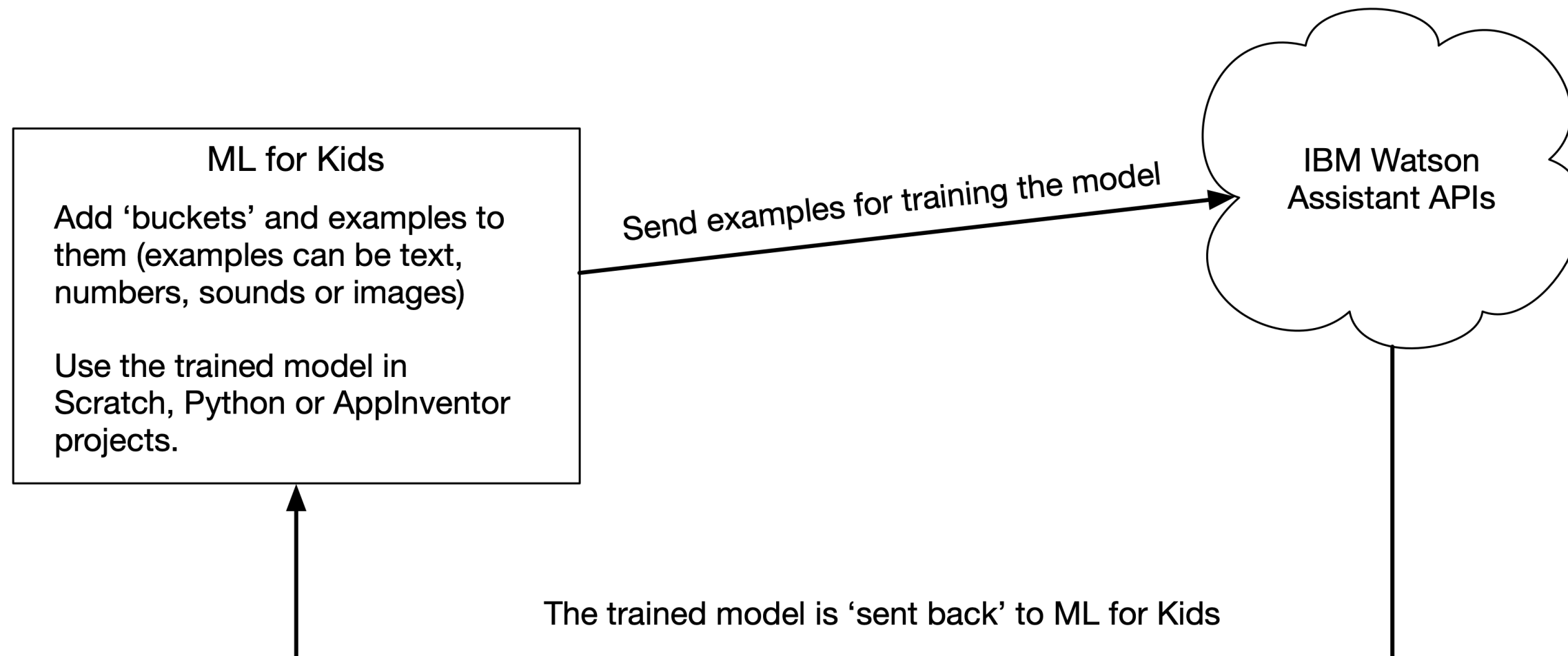


The image displays the Scratch code editor interface. On the left, a script is written in the code area:

```
when clicked  
repeat 3  
  if recognise image costume image (label) = cat then  
    say I'm a cat! for 20 seconds  
  else  
    say I'm a dog! for 2 seconds  
  next costume
```

On the right, the stage area shows a cat image with a speech bubble that says "I'm a cat!". Below the stage, the sprite control panel is visible, showing the sprite name "Sprite1", its position (x: 0, y: 0), size (100), and direction (90). The backdrop panel shows a single backdrop labeled "1".

How it Works



— Usage of IBM Watson Assistant can cost \$

Resources

- Worksheets
- Project templates (e.g, pictures of cats and dogs, passengers on the titanic)
- Sample projects within Scratch and Code editors
- Raspberry Pi Foundation: Scratch Machine Learning projects

Training a Smart Assistant

- We will use the Raspberry Pi Foundation's version of the Smart Classroom Assistant activity
- We will compare coding with rules and machine learning first
- You will create a Scratch project that 'understands' different instructions for turning a fan and light on and off

Application of these Models

- Amazon Alexa Skills
- As described in Smart Classroom activity:
 - Buckets are created for different commands
 - Examples of appropriate phrases are added to each of the buckets
 - Model is trained with these examples