

# LESSON 1

Using machine  
learning to spot the  
shark

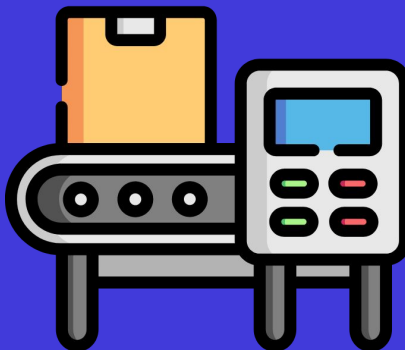


# Machine Learning Recap

## 1 Input Data

- Images, photos
- Movies, TV shows
- Search history
- Songs

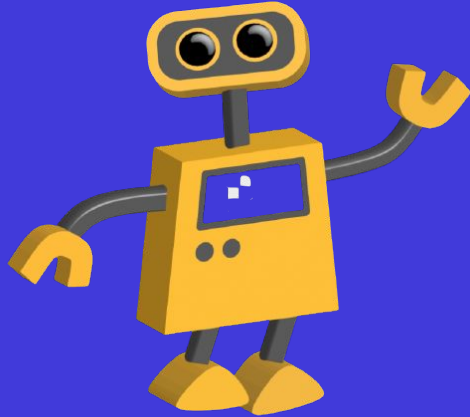
## 2 Model



## 3 Prediction

- Classify images - dog vs cat
- Recommend more movies
- Personalise search results
- Create personal playlists

# WE NEED YOUR HELP



# Use machine learning to spot the shark?

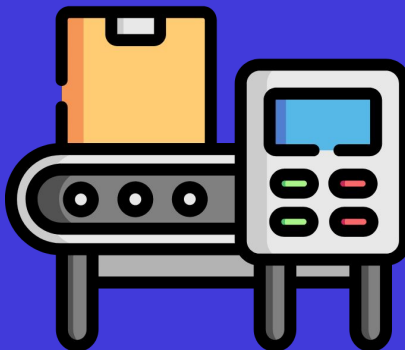
- **It's summertime and there is a beautiful beach where lots of people go to swim**
- **However, at the same beach there are dolphins and sharks in the water**
- **Can you build a machine learning model to identify the sharks?**

# We need to build a “shark detection” model

## 1 Input Data



## 2 Model



## 3 Prediction

Shark

Dolphin

# Computers learn just like we do – by example

We need to give the model “training data”

## Training Data

Show examples of what cars  
look like



## Testing Data

Show the model a new example to  
make a prediction



Prediction -> CAR == TRUE

# Training Teachable Machines

<https://teachablemachine.withgoogle.com/train/image>

ADD SHARK

USE WEBCAM TO SHOW IMAGES OF SHARKS FROM TRAINING SET

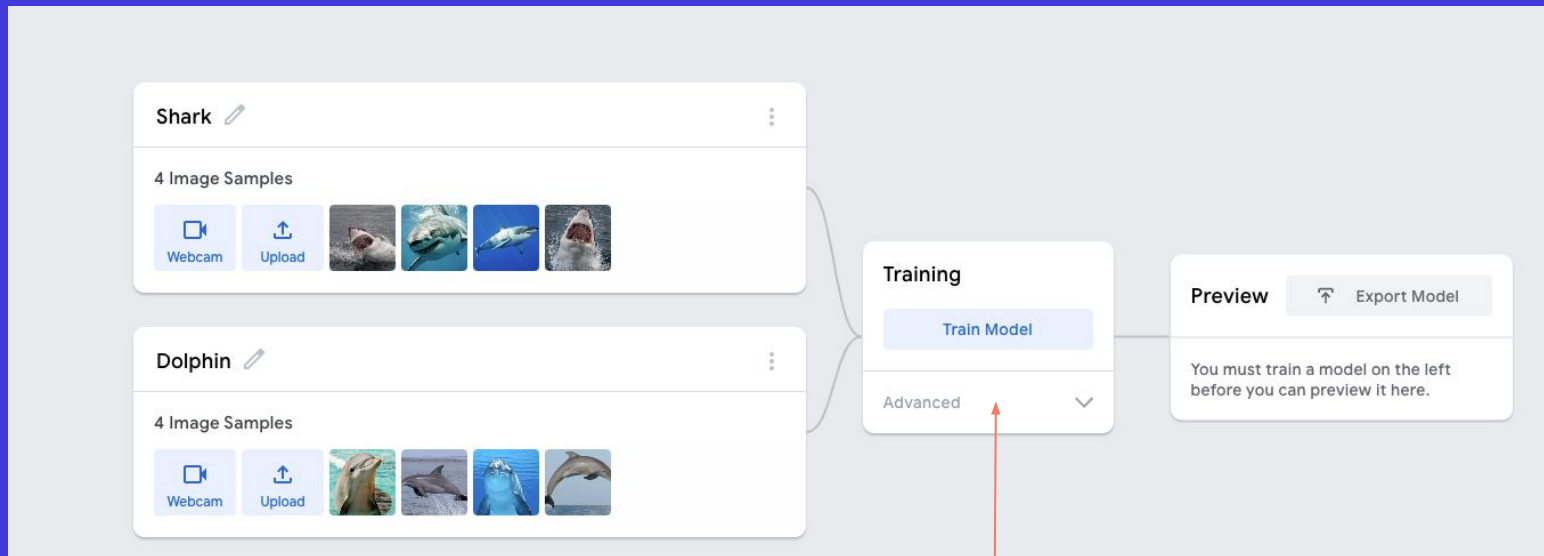
ADD DOLPHIN

The screenshot displays the Teachable Machine web interface. On the left, there are two class cards: 'Shark' and 'Dolphin'. Each card has a title, an edit icon, and a section for '4 Image Samples'. Below the samples are 'Webcam' and 'Upload' buttons. The 'Shark' card shows four images of sharks, and the 'Dolphin' card shows four images of dolphins. Red arrows point from the text labels to the 'Webcam' buttons on both cards. In the center, a 'Training' panel shows a 'Train Model' button and an 'Advanced' dropdown menu. On the right, a 'Preview' panel shows an 'Export Model' button and a message: 'You must train a model on the left before you can preview it here.'

USE WEBCAM TO SHOW IMAGES OF DOLPHINS FROM TRAINING SET

# Training Teachable Machines

<https://teachablemachine.withgoogle.com/train/image>



**SELECT TRAIN MODEL**



# Testing Teachable Machines

<https://teachablemachine.withgoogle.com/train/image>

SHOW TEST DATA IMAGES ON  
THE WEBCAM

The screenshot displays the Teachable Machine web interface. On the left, there are two class cards: 'Shark' and 'Dolphin'. Each card has a 'Webcam' button and an 'Upload' button, followed by four image samples. Below these is a dashed box labeled 'Add a class'. In the center, a 'Training' panel shows 'Model Trained' and an 'Advanced' dropdown. On the right, a 'Preview' panel is active, showing a 'Webcam' input toggle set to 'ON' and a 'Switch Webcam' button. Below this is a large black video feed area with a white circular loading icon. At the bottom of the preview panel, an 'Output' section shows two horizontal bars: an orange bar for 'Shark' at 98% and a pink bar for 'Dolphin'.

Shark

4 Image Samples

Webcam Upload

Dolphin

4 Image Samples

Webcam Upload

Add a class

Training

Model Trained

Advanced

Preview

Export Model

Input ON Webcam

Switch Webcam

Output

Shark 98%

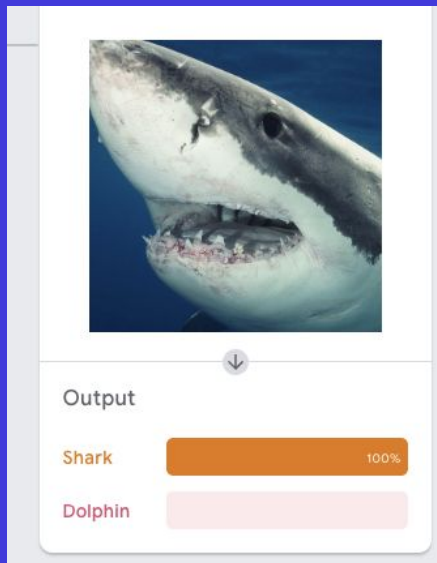
Dolphin

SEE PREDICTION HERE

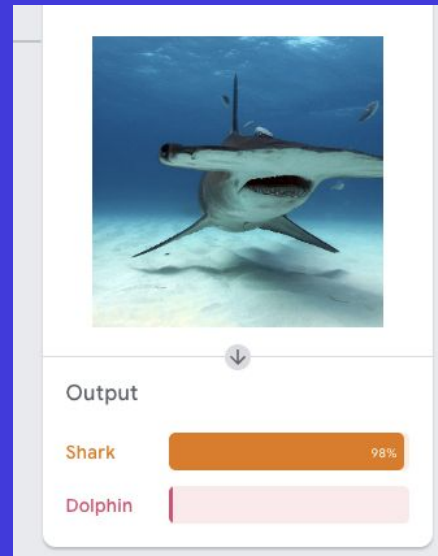
# Discussion: How Accurate is our model?

<https://teachablemachine.withgoogle.com/train/image>

CAN YOUR MODEL CAN IDENTIFY NEW UNSEEN SHARK IMAGES?

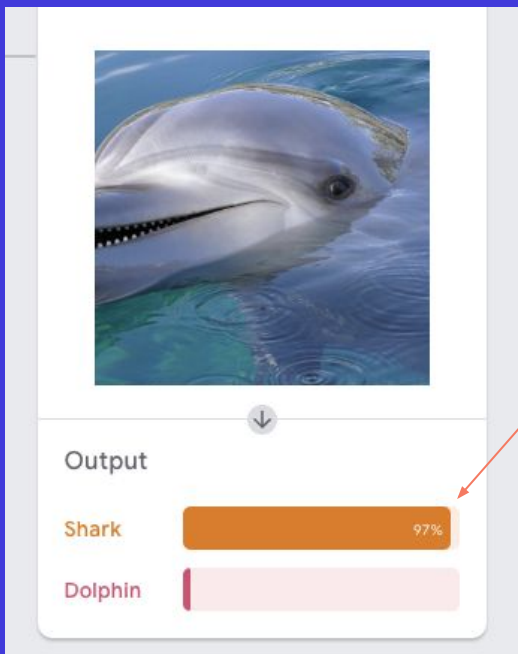


EVEN NEW KINDS OF SHARK?



# Discussion: Does the model get some wrong?

<https://teachablemachine.withgoogle.com/train/image>



OOPS ... OUR MODEL THINKS THIS DOLPHIN IS A SHARK?

# Discussion: How to improve the model?

To improve we need more training data

Images of dolphins with  
sharp teeth



Images of sharks jumping  
out of the water

