Machine Learning For Kids :: Teachers' notes

Worksheet	Rock, Paper, Scissors
Activity	Make a Rock, Paper, Scissors game in Scratch that learns to recognise hand shapes.
Objective	**Teach a computer to recognise shapes** • How computers can be trained to recognise pictures. • The important of variety in training machine learning systems.
Difficulty level	Intermediate Taking the training photos of your own hand needs coordination.
Time estimate	45 minutes
Summary	Students will train a machine learning model to recognise pictures of hand shapes. They will use this to make a project in Scratch that plays rock, paper, scissors.
Topics	image classification, supervised learning

Setup

Each student will need:

Print-outs	Project worksheet (download from https://machinelearningforkids.co.uk/worksheets) Blocks in Scratch scripts are colour-coded, so printing in colour will make it easier for students.
Technology	Web-cam
Access	Username and password for machinelearningforkids.co.uk

Class account will need:

API keys	**Watson Visual Recognition** 1 custom model per student One "Lite" API key is free but can only be used to create 2 custom models One "Standard" API key can be used to create to create multiple custom models more detail at: https://github.com/IBM/taxinomitis-docs/raw/master/docs/pdf/machinelearningforkids-apikeys.pdf

Help

Potential issues

- Students will take photos of their hands and upload them to a secure site, where they are kept until their photo or project is deleted. As long as only hands are visible in photos, students are unlikely to be identifiable. If using laptops, angling the screen towards the ceiling helps. However, if photos accidentally including students is a concern it may be useful to obtain parental permission.
- Students often take very similar training photos. This is less likely to be effective than photos of a variety of positions and angles. It's helpful to highlight this and encourage students to think about why.
- Machine Learning models for image projects sometimes take up to 5 minutes to train. Students can continue to work on their Scratch project scripts while they wait, if you like. They won't be able to run the project until the status light next to their project name in Scratch will go green when it's ready.

General troubleshooting and help at https://machinelearningforkids.co.uk/help