Machine Learning For Kids :: Teachers' notes

Worksheet	Chameleon
Activity	Make a chameleon in Scratch that changes colour to match its background.
Objective	**Teach a computer to recognise colours** • Learn how computers can be trained to recognise the predominant colour of an object
Difficulty level	Beginner
Time estimate	1 hour
Summary	Students will train a machine learning model to recognise colours by taking pictures of coloured objects with a computer webcam. They will use this in Scratch to make a character that recognises the colour and changes costume to match.
Topics	image classification, supervised learning

<table>
<tr><td colspan="3" align="center">Setup</td></tr>
<tr><td colspan="3">Each student will need:</td></tr>
<tr><td></td><td>Print-outs</td><td>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.</td></tr>
<tr><td></td><td>Technology</td><td>Web-cam</td></tr>
<tr><td></td><td>Access</td><td>Username and password for machinelearningforkids.co.uk</td></tr>
<tr><td colspan="3">Class account will need:</td></tr>
<tr><td></td><td>API keys</td><td>None</td></tr>
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<table>
<tr><td colspan="2" align="center">Customizing</td></tr>
<tr><td colspan="2">If you use PRIMM approaches with your class, add a step where students predict how the project template works.
If you want to increase the amount of coding involved, delete some of the code from the project template and add steps to the worksheet so students code it themselves.
If you want to encourage problem solving, delete some of the detail in the worksheets and provide more general instructions instead.
Project template files & worksheets in MS Word format are available so you can modify them to suit your class.</td></tr>
<tr><td>Template</td><td>https://github.com/IBM/taxinomitis-docs/tree/master/scratch-templates</td></tr>
<tr><td>Worksheets</td><td>https://github.com/IBM/taxinomitis-docs/tree/master/project-worksheets/msword</td></tr>
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<tr><td colspan="2" align="center">Help</td></tr>
<tr><td>Potential issues</td><td>• Students will be taking photos and uploading them to a secure site. As long as only the objects are visible in photos they take, then students will not be identifiable from this. If this raises concerns it may be sensible to obtain parental permission.
• Machine learning models can sometimes take up to 5 minutes to train. It is okay for students to work on their Scratch projects during this time, rather than wait for this to complete first.
• "https://machinelearningforkids.co.uk" is a long URL to type for some children. You may find it easier to set up a bookmark that they can click on instead.

General troubleshooting and help at https://machinelearningforkids.co.uk/help</td></tr>
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