

runlinc Project 12 Al3: Simple Image Recognition Demonstration

(E32W Version)

Contents

Introduction

Aim

Upload image and use third party machine learning JavaScript to compute the classification of the image with runlinc

Background and Plan

Image processing with artificial intelligence (AI) is relatively simple. It thinks like a human brain.



Figure 1 Image loaded into computer and through AI, result is shown at the end

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Since we use the data base from third-party resource, we don't need to insert data by ourselves. We only need to know some syntaxes from that third-party resource for JavaScript. We won't be needing any inputs for the Microchip. Red and Green LEDs will be used to signify that the respective process associated with the LED has been successful.



Figure 2 Block diagram of Microchip Outputs

runlinc Background

runlinc is a web page inside a Wi-Fi chip. The programming is done inside the browsers compare to programming inside a chip. The runlinc web page inside the Wi-Fi chip will command the microchips to do sensing, control, data logging Internet of Things (IoT). It can predict and command.

Part A: Design the Circuit on runlinc

Note: refer to runlinc Wi-Fi setup guide document to connect to runlinc

D18	DIGITAL_OUT \$	red	OFF
D19	DIGITAL_OUT \$	green	OFF
D21	DIGITAL_OUT \$		OFF

Figure 3 Digital outputs and description

For port D18 name it red and set it as DIGITAL_OUT.

For port D19 name it green set it as DIGITAL_OUT.

For port D21 set it as DIGITAL_OUT.

Part B: Build the Circuit

Use the STEMSEL E32 board to connect the hardware. For this project we are using both the left and right I/O ports, with **negative port (-ve)** on the outer side, **positive port (+ve)** on the middle and **signal port (s)** on the inner side (as shown below).



Figure 4: Setup on E32W board

There is only one I/O parts we are using for this project, a 3-pin RGB LED, its respective pins are shown in the figure below.



Figure 5: I/O parts with negative and signal pins indicated

Wiring Instructions

- Plug in the LED to signal ports io18, io19 and io21on the E32W board with the "Red" pin on the light that goes into io18, corresponding to the port D18 we've set as Digital_Out and named as "red".
- All part's pin need plug in signal port (s)
 - a. C18->DIGITAL_OUT : red
 - b. C19->DIGITAL_OUT : green
 - c. C21->DIGITAL_OUT : negative



Figure 6: Setup on E32W board

Part C: Program the Circuit

As the main purpose of this project is to demonstrate the image recognition capability of the microchip and coding, you'll be mainly just copy and pasting the code to see the effects of the code.

HTML:

<script src="https://unpkg.com/ml5@0.1.3/dist/ml5.min.js"></script>
<h1>Image classification</h1>
<input id="load"/>
<input onclick="imgProcess()" type="submit"/>
This labeled as:
 with a confidence of

supported by MobileNet

Javascript:

```
var type = "";
turnOn(red);
turnOn(green);
     function imgProcess() {
       // The image we want to classify
       var loadIMG = document.getElementById("load");
       var image = document.getElementById('image');
       image.setAttribute("src", loadIMG.value);
       // The result tag in the HTML
       const result = document.getElementById('result');
       // The probability tag in the HTML
       const probability = document.getElementById('probability');
       // Initialize the Image Classifier method with MobileNet
       const classifier = ml5.imageClassifier('MobileNet', function () {
          console.log('Model Loaded!');
       });
       // Make a prediction with the selected image
       // This will return an array with a default of 10 options with their probabilities
       classifier.predict(image, async function (err, results) {
          result.innerText = results[0].className;
          type = results[0].className;
          probability.innerText = results[0].probability.toFixed(4);
          var utterance = new SpeechSynthesisUtterance(results[0].className);
          speechSynthesis.speak(utterance);
          switch (type) {
             case 'tiger shark, Galeocerdo cuvieri': //example:
https://www.dw.com/image/45601658 401.jpg
               turnOn(red);
               turnOff(green);
               break:
             case 'matchstick':
               turnOn(green);
               turnOff(red);
               break:
             case value:
               turnOff(red);
               turnOff(green);
               break;
             default:
               break;
          }
       });}
```

Part D: Run the application

How to get image link:

Step 1: Search any image you like. Example: tiger shark

Google	tiger shark					U Q		
	All Images	Videos	News	Shopping	More	Settings	Tools	
	About 135,000,000 results (0.46 seconds)							
	Videos							
	1.4	e		An		A. A		

Step 2: Click on Image



Step 3: Right click on the image you like and select "Copy image address"



Step 4: Paste it in runlinc page and click submit

Image classification

 Submit

This labeled as: tiger shark, Galeocerdo cuvieri with a confidence of 0.9988



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