What's This Fruit? 🍒 Tensorflow JS

Fikri

Growth Session #16 - July 12-13 2018

Demo

192.168.100.177:3000

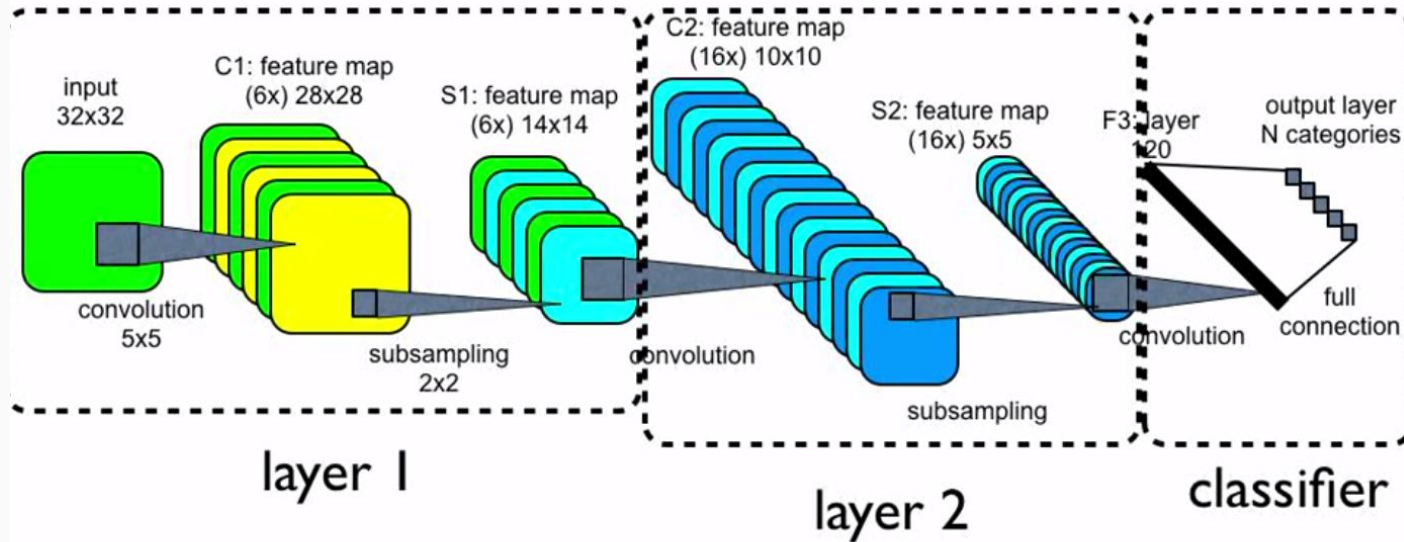if you have Firefox on your mobile, or

nimbl3.github.io/whats-this-fruit/

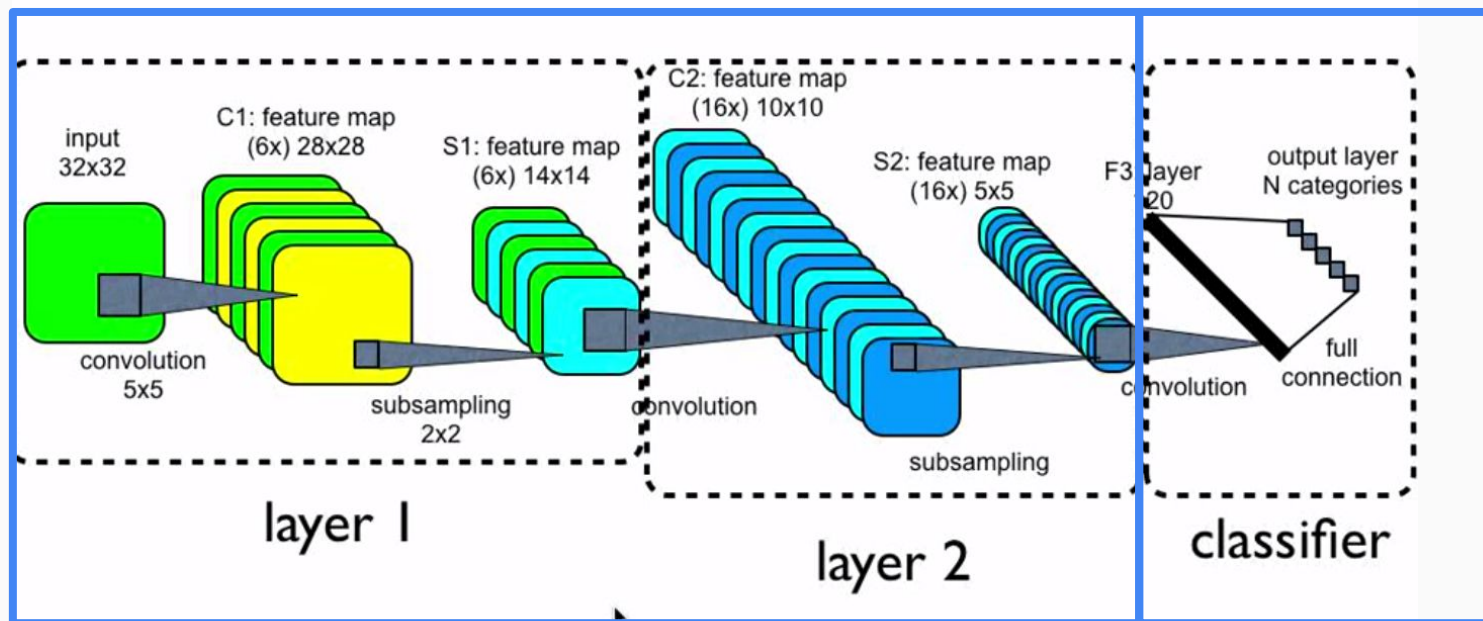Beware, opening that will download >60 MB Model data :)

Two parts of this project:

1. Training the model using Keras, and Tensorflow

2. Attaching the model to the browser using Tensorflow JS

Convolutional Neural Networks

Freeze this part   Train this part

Fine-tuning pre-trained model using Keras, and Tensorflow

Documentation for individual models

Model	Size	Top-1 Accuracy	Top-5 Accuracy	Parameters	Depth
Xception	88 MB	0.790	0.945	22,910,480	126
VGG16	528 MB	0.715	0.901	138,357,544	23
VGG19	549 MB	0.727	0.910	143,667,240	26
ResNet50	99 MB	0.759	0.929	25,636,712	168
InceptionV3	92 MB	0.788	0.944	23,851,784	159
InceptionResNetV2	215 MB	0.804	0.953	55,873,736	572
MobileNet	17 MB	0.665	0.871	4,253,864	88
DenseNet121	33 MB	0.745	0.918	8,062,504	121
DenseNet169	57 MB	0.759	0.928	14,307,880	169
DenseNet201	80 MB	0.770	0.933	20,242,984	201

Fine-tuning pre-trained model using Keras, and Tensorflow

- Using Azure Machine:

| ADD TO ESTIMATE	INSTANCE	CORE	RAM	TEMPORARY STORAGE	GPU	PAY AS YOU GO
⊕	NC6 v2	6	112.00 GiB	336 GiB	1X P100	$2.07/hour

-

- Tutorial from: Keras Tutorial: Fine-tuning using pre-trained models, and Building powerful image classification models using very little data

- Jupyter Notebook File on Github Repository

Fine-tuning pre-trained model using Keras, and Tensorflow

Training Data Matter

vs

https://www.kaggle.com/moltean/fruits
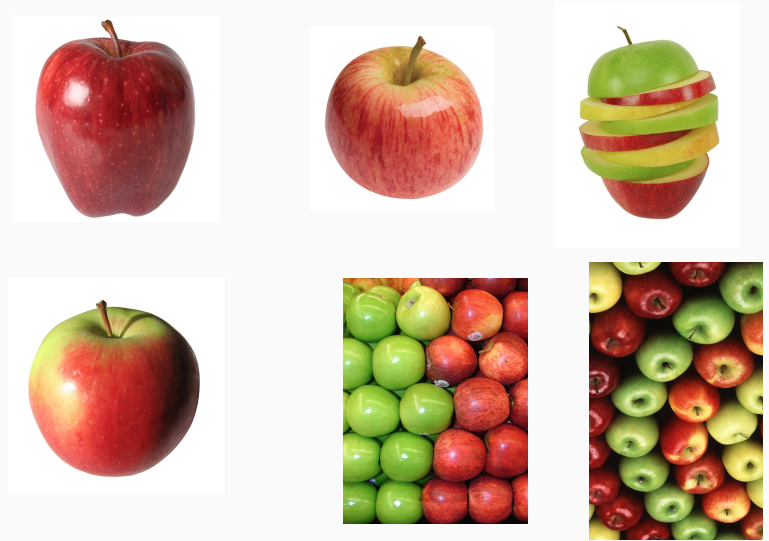
49606 images of 74 fruits

http://www.vicos.si/Downloads/FIDS30

971 images of 30 fruits

TensorFlow.js

A JavaScript library for training and deploying ML models in the browser and on Node.js

Develop ML with JavaScript

Use flexible and intuitive APIs to build and train models from scratch using the low-level JavaScript linear algebra library or the high-level layers API

Run Existing Models

Use TensorFlow.js model converters to run pre-existing TensorFlow models right in the browser or under Node.js.

Retrain Existing Models

Retrain pre-existing ML models using sensor data connected to the browser, or other client-side data.

Attaching the model to the browser using Tensorflow JS

Format conversions support table

input format	output `tensorflowjs`	output `keras`
`keras`	✓	✗
`tensorflowjs`	✗	✓
`tf_frozen_model`	✓	✗
`tf_hub`	✓	✗
`tf_saved_model`	✓	✗
`tf_session_bundle`	✓	✗

Next Steps

- Reduce the model file. Currently the model file is 65 MB. The example on Google site is only 2MB. (╯°□°)╯ ︵ ┻━┻

- Use more training dataset

- Use a different model e.g. MobileNet v2

- Consider using back-end model instead of browser model

Even if it might take a lifetime to learn Deep Learning properly, you can spend a weekend to learn Deep Learning to get significant and useful results

Thanks!

Contact Nimbl3

hello@nimbl3.com

399 Sukhumvit Road, Interchange 21
Klongtoey nua, Wattana
Bangkok 10110

28C Stanley St,
Singapore 068737

20th Floor, Central Tower
28 Queen's Road
Central, Hong Kong

nimbl3.com