Intro to OpenCV

Python Request library and HTTP

What is HTTP?

The Hypertext Transfer Protocol (HTTP) is designed to enable communications between clients and servers.

HTTP works as a request-response protocol between a client and server.

Example: A client (browser) sends an HTTP request to the server; then the server returns a response to the client. The response contains status information about the request and may also contain the requested content.

The two most common HTTP methods are: GET and POST.

<https://www.w3schools.com/tags/ref_httpmethods.asp>

Request library

The [requests](http://docs.python-requests.org/en/master/) library is the de facto standard for making HTTP requests in Python. It abstracts the complexities of making requests behind a beautiful, simple API so that you can focus on interacting with services and consuming data in your application. We will be using the request library to POST a plant image to a server and get a response of which plant it is.

Installing request library.

For Windows, Go to command prompt and type,

pip install requests

For the raspberry pi, Open terminal and type,

pip3 install requests

<https://realpython.com/python-requests/>

application-programming interface

An application-programming interface (API) is a set of programming instructions and standards for accessing a Web-based software application or **Web tool**. A software company releases its API to the public so that other software developers can design products that are powered by its service.

For example, Amazon.com released its API so that Web site developers could more easily access Amazon's product information. Using the Amazon API, a third party Web site can post direct links to Amazon products with updated prices and an option to "buy now."

We will be using the plantnet api to recognize plants.

<https://money.howstuffworks.com/business-communications/how-to-leverage-an-api-for-conferencing1.htm>

API Key

An **application programming interface key** (**API key**) is a unique identifier used to authenticate a user, developer, or calling program to an [API](https://en.wikipedia.org/wiki/Application_programming_interface). The plantnet API requires an API key to use the api, this is done later by creating an account.

https://en.wikipedia.org/wiki/Application\_programming\_interface\_key

JSON

JSON stands for **J**ava**S**cript **O**bject **N**otation

JSON is a lightweight format for storing and transporting data

JSON is often used when data is sent from a server to a web page

JSON is "self-describing" and easy to understand

After posting an image to the plantnet API the response we get back is in JSON format.

https://www.w3schools.com/whatis/whatis\_json.asp

Opening Files in Python

The key function for working with files in Python is the open() function.

The open() function takes two parameters; filename, and mode.

There are four different methods (modes) for opening a file:

"r" - Read - Default value. Opens a file for reading, error if the file does not exist

"a" - Append - Opens a file for appending, creates the file if it does not exist

"w" - Write - Opens a file for writing, creates the file if it does not exist

"x" - Create - Creates the specified file, returns an error if the file exists

In addition you can specify if the file should be handled as binary or text mode

"t" - Text - Default value. Text mode

"b" - Binary - Binary mode (e.g. images)

https://www.w3schools.com/python/python\_file\_handling.asp

my.plantnet.org

Pl@ntNet is a tool to help to identify plants with pictures. We can capture an image of a plant and use the plantnet api to identify the plant. With the request library we can POST an image to the server and the server gives us a response which is in json.

1 Create an account at my.plantnet.org.

2 After loging in go to <https://my.plantnet.org/account/settings> and make a note of the api key.

The free version of trefle has a limit to a maximum of 50 API queries.

Plantnet API documentation: https://my.plantnet.org/account/doc