

Efficient Way of Web Development Using Python and Flask

Vangala Rama Vyshnavi, Amit Malik

Department of Computer Science and Engineering, SRM University Haryana, India

Abstract: Web is the most frequently and rapidly used networking aid which satisfies the requirements of all type of users and which provides a solution for any type of problem. For designing and developing such well defined and well structured, we have to choose a proper technology. Therefore a dynamic web application or portal can be developed by using flask and python. Various applications such as hand gestures can be easily developed by python which helps various people. Good development of a web page or an application can be easily attract users which leads to success of the project. The technological needs of a web development project can be achieved by using “python” and “flask”.

Keywords: Web development, templates, python, flask, Jinja, opencv, pages, hand gestures

I. INTRODUCTION

How Python web development is efficient using Flask:

Python is a general purpose, high level programming language that focuses on the code readability, for web development lines of code will be fewer than other languages. It is possible for Python because of large standard libraries which make the Web development code simple and short. These libraries have pre-coded functions provided by Python community which can be easily downloaded and can be used as per the development needs. Initially Python was designed for web designed for web servers to deal with the incoming traffic on the server.

Flask uses Jinja Template Engine and the Werkzeug WSGI ToolKit. Flask structures categories into two parts “Static files & Template files”, template file have all the Jinja templates including Html pages, whereas static file have all static codes needed for website such as CSS code, JavaScript code and Image files.

B. Technical Advantages:

a. Robust

Robustness is the ability of system to cope with errors during execution. Robustness is also used as the ability of an algorithm to continue operating despite abnormalities in input, calculations, etc. robustness can encompass many areas of web development.

b. Open Source:

Python & Flask are an open source languages in which the source code is available to the general public for use and/or modification from its original design. Open-source code is typically a collaborative effort where other developers can improve upon the source code and share the changes within the community so that order members can help improve it further.

Introduction to Python:

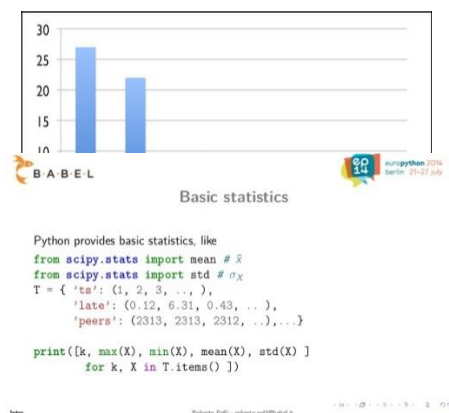


Python is a popular programming language. It was created by Guido van Rossum, and released in 1991. It is used for Web development, server development, mathematics, system scripting.

Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc). Python has a simple syntax similar to the English language. Python has syntax that allows developers to write programs with fewer lines than some other programming languages. Python can be treated in a procedural way, an object-oriented way or a functional way. Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that Prototyping can be very quick.

a) Features of Python:

- (i) Small Core
- (ii) Clear, Concise, and Orthogonal Syntax
- (iii) Self Documenting
- (iv) Easy supports for default arguments
- (v) Object-Oriented file handling
- (vi) Method Chaining



Introduction to Flask:



Flask is a web framework. This means flask provides you with tools, libraries and technologies that allow you to build a web application. This web application can be web pages, a blog, a wiki or go as a web-based calendar application or a commercial website. Flask is a lightweight web application framework written in Python and based on the WSGI toolkit and Jinja2 template engine. Flask is part of the Categories of the micro-framework. Micro-framework are normally framework with little to no dependencies to external libraries.

a) Features of Flask:

- (i). Integrated supports for Unit Testing
- (ii). Uses Jinja2 Templating
- (iii). Supports for secure cookies
- (iv). Extensive documentation
- (v). Google app engine compatibility
- (vi). Restful request dispatching

Introduction to OPENCV:

Opencv Python is a library of Python bindings design to solve computer vision problems. It is the Python API for Opencv. It was built to provide a common infrastructure for applications and to accelerate the use of machine perception.

It supports a large variety of programming languages such as C++, JAVA etc and available for different platforms for high speed operations. Opencv Python makes use of Numpy which is highly optimise library for numerical operations. It is free of cost and it can be written in any language.

It's applications areas include recognition systems, object identifications, tracking etc. It includes a statistical machine learning Library that contains neural networks, decision tree and maximization algorithms .

II. IMPLEMENTATION OF BASIC PAGES

A. The Support from Creation of Decorative Template by Using Flask:

a) Hello World Program:

The basic example of Flask is a Hello World program in Flask where we are importing Flask class using import function, then we are defining hello world function and then returning 'Hello World!'

```
From flask import Flask
App= Flask(__name__)
@app.route('/')
def hello_world():
return 'Hello World!'
if __name__ == '__main__':
app.run()
```

b) Template Inheritance:

Template Inheritance in Flask allows developers to build a base template which can be overridden by child template. It uses `{%block%}` and tells base template that child template may override the functionality defined in `{%block%}`. `{%extends %}` section defines that this template can "extend" another template. When the template system evaluates this template, first it locates the parent. The extends tag must be first in the template. To provide the contents of a block defined in the parent template, use `{{super()}}`.

Index.html:

```
{%extends "layout.html" %}
{%block content %}
<h1>Say something</h1>
<form method="post" action="{{ url_for('signup') }}">
<p> <label> Username:</label>
<input type="text" name="username"
required> </p> <p> <label> Message:</label>
<textarea name="message"> </textarea> </p>
<p> <button type="submit">Send
</button> </p>
</form>
{
{% endblock %}
```

message.html:

```
{% extends "layout.html" %}
{% block content %}
<h1>{{ username }} said:</h1>
<p>
{{ message
}} </p>
<a href="{{ url_for('home') }}"> Say something
Else</a> {% endblock %}
```

```
Layout.html:
<!doctype html>
<html lang="en">
<head>
<title>Say something</title>
<meta http-equiv="content-type"
content="text/html;
Charset=utf-8">
<link rel="shortcut icon" href="{{ url_for('static',
Filename='favicon.ico') }}">
</head>
<body>
{% block content %} {% endblock %}
</body>
</html>
```

- Motion detection and thresholding
- Contour Extraction
- Count my fingers
- Four intermediate steps
- Contours
- Bitwise AND
- Euclidian distance
- Convex Hull

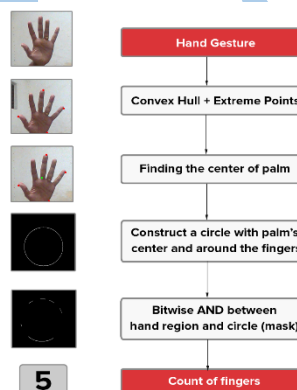
IV. RESULT

After implementation we can run our project and see the output. After access the web camera and it should not be shake during the calibration period of 30 frames. After that, you can use bring in your hand into the bounding box, show gestures and the count of fingers will be displaced accordingly.

c) File Organization:

File Organization is used to define the way in which the files are arranged in the directory and it shows the way in which they can be called. Example “/” is used to define the index page.

```
Example/
__init__.py
static/
favicon.ico
templates/
index.html
hello.html
```



V. FUTURE SCOPE

Python and Flask are portable and interactive languages for web development including dynamic semantics potential. In python it is also possible to bind new modules to python to extend its core functionality. Many of the great websites are moving to python due to its robustness .It can be of great databases and very easy way to use standard libraries. Powerful text processing is also enabling. Python is a fast growing technology having many features.

VI. CONCLUSION

This paper can conclude as python can be more efficient than any other web development languages, because python is fast, broad and better than java, perl, tcl etc. Python Jinja flask are more useful for maintaining complexity technologies. These are also helps for data fetch from WWW. It is more powerful, fast with the help of flask Template Engine. Therefore python is great for backend web development.

How Python will support web development in applications:

Example:

Hand gestures is an application which is efficiently designed in python by using some external libraries like **opencv**. The **opencv** is the library which can be used in the real time applications which advantages in multicore processing. Opencv, in this project is used to capture video from the camera as a input from the user side. Gesture recognition has been a very interesting problem in computer vision for a long time. This is particularly due to the fact that segmentation of foreground object from a clustered background is a challenging problem in real time.

III. IMPLEMENTATION

In this implementation we are implementing few contents using opencv and python for gestures.

- Segment the hand region
- Background subtraction

REFERENCES:

- [1]. International Journal of Advanced Research in Computer[ISSN No.0976-5697]
- [2]. <http://core.ac.uk/download/pdf/55305148.pdf>
- [3]. By Armin Ronacher, “Flask Web Development, One Drop at a Time”, <http://flask.pocoo.org/March> 20th 2015.
- [4]. By Armin Ronacher “The Templates”, <http://flask.pocoo.org/docs/0.10/tutorial/templates/March> 20th 2015
- [5]. By PhilipGuo, <http://www.pgbovine.net,July2014>
- [6]. By Sheetal Taneja, Pratibha R.Gupta “Python as a Tool for Web Server ApplicationDevelopment” https://www.jimsindia.org/8i_journal/volumeii/python-as-a-tool-for-web-server-application-development.pdf Jan 2014.
- [7]. Kubica,Marek, “How to use Python in the web.” <https://docs.python.org/2/howto/webrowsers.html>.
- [8]. Grove, Ralph F. “Web based Application Development.” Jones & Bartlett Publishers, 2009.
- [9]. “Django.” <https://www.djangoproject.com>