



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 11, Issue 6, June 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.118



9940 572 462



6381 907 438



ijirset@gmail.com



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A Survey on Python Based Text Extraction System

Prof. Harish B G*, Marideva H S**

Assistant Professor, Department of Master Applications ,University B. D. T College of Engineering, Davanagere,
Karnataka, India.*

P.G. Student, Department of Master Applications ,University B. D. T College of Engineering, Davanagere,
Karnataka, India.**

ABSTRACT:It is one of the most popular research areas in image analysis because it is a prerequisite for representing an object. In the field of image processing, features are extremely important. Before obtaining features, the sampled image is subjected to various image preprocessing techniques such as binarization, thresholding, resizing, normalisation, and so on. Following that, feature extraction techniques are used to obtain features that will be useful in image classification and recognition. Techniques for extracting features are useful in a variety of image processing applications, such as character recognition. Because features define an image's behaviour, they reveal its position in terms of storage required, classification efficiency, and, of course, time consumption. The Image Process project's main goal is to extract important information from photographs. Based on the extracted data, the machine may generate a description, interpretation, and comprehension of the scene. Image processing's main goal is to transform photos in the desired way.

KEYWORDS:image, thresholding, preprocessing.

I. INTRODUCTION

Text data in images contains useful information for automatic annotation, indexing, and image structuring. The extraction of this information entails detecting, localising, tracking, extracting, enhancing, and recognising text from a given image. However, text variations due to differences in size, style, orientation, and alignment, as well as low image contrast and a complex background, make automatic text extraction a difficult problem. While there are comprehensive surveys of related problems such as face detection, document analysis, and image indexing, the problem of text information extraction is not well surveyed. To address this problem, a large number of techniques have been proposed, and the purpose of this paper is to classify and review these algorithms, discuss benchmark data and performance evaluation, and point out promising directions for future research.

The process of attaching labels to images based on their content is referred to as content-based image indexing. Image content is classified into two types: perceptual content and semantic content. Color, intensity, shape, texture, and their temporal changes are examples of perceptual content, whereas semantic content refers to objects, events, and their relationships. Several studies on the use of low-level perceptual content for image and video indexing have already been published. Recent research has focused on semantic image content in the form of text, face, vehicle, and human action. Text within an image is particularly appealing among them.

-It is very useful for describing the contents of an image;

→ It can be easily extracted compared to other semantic contents, and

→ It enables applications such as keyword based image search, automatic video logging, and text-based image indexing

Objective of the project

A group of features in the form of a feature vector represents the object. This feature vector is used to recognise and classify objects. The goal of this project is to introduce techniques that can be used to achieve the required level of object recognition in a brief manner.

II. RELATED WORK

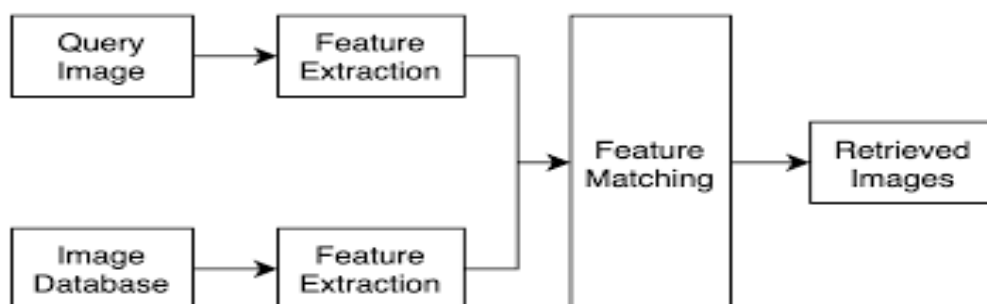
Among those who have contributed to this work are Stefan van der Walt, Johannes L. Schonberger, Juan Nunez-Iglesias, Francois Boulogne, Joshua D. Warner, Neil Yager, Emmanuelle Gouillart, Tony Yu, and others. [1] Scikit-image, a suite of image processing algorithms written in Python and released under the BSD Open Source licence, was created by a dedicated group of volunteers. Python's growing popularity as a scientific programming language, combined with an expanding ecosystem of supporting tools, makes it an ideal environment for developing an image processing toolkit.

Yurong Guan¹, Fei Zhou², Jing Zhou et al. The relevant experimental programming language should be expanded in the practise of digital image processing. Python should be the preferred testing language. It is easier for students to grasp the language itself, allowing them to focus their energy and time on imagining solutions to problems, increasing their desire to learn and improve their practical abilities. Python has grown in popularity in the field of digital image processing in recent years. Language use in mathematical modelling has received a great deal of attention, as have various big data competitions. According to a PIL library study and analysis, there is still room for more research and development in areas such as image and graphics contrast processing, graphics image storage, and graphics image rendering. It also discusses image filtering technology, outline image contour, relief style, image edge, and other topics. Muhammad ArifRidoy et al. [3] stated It has seen significant growth in both acceptance and dedication in recent years, and the group is eager to work with others to help it grow even further and establish itself as the definitive Python image processing library. Scikit-image performs a wide range of image processing calculations with a straightforward interface that works well with both 2D and 3D images. It is fully integrated into the Scientific Python environment, which means it is compatible with perception libraries and other data preparation tools. Scikit-image has grown tremendously since its inception in 2009, both in terms of clients and added features. Despite the growing number of logical groups that use scikit-image to prepare images of various X-beam modalities, area-specific instruments are now relying on scikit-image to expand their capabilities.

III. METHODOLOGY

In real life, we collect a large amount of data. We need a process to understand this data. It is not possible to process them manually. This is where the concept of feature extraction comes into play.

When you have a large data set and need to reduce the number of resources without losing any important or relevant information, the feature extraction technique comes in handy. Feature extraction assists in reducing the amount of redundant data in a data set.



This Python-based application is an online integrated development environment (IDE) and Web hosting service. It includes a code editor with syntax highlighting and browser access to server-based Python and Bash command line interfaces. This application makes use of the Visual Studio IDE, the SQLite backend, and the libraries NumPy, pandas, and OpenCV (libraries). Our application has a better user interface, and once the user uploads the data set, it can be easily extracted.

Image processing is becoming increasingly important in everyday life. There is growing interest in developing computer vision systems that can recognise road hazards, familiar faces, or scenes in photographs.

Imaging is the representation of an object's external form. That definition is no longer accurate. More information can be considered within an image. Some of the most recent additions are fluorescent tags, mechanical-biological parameters, and internal structures. Imaging can include fabrication as well as the characterization of yet-undefined materials.

FEATURE TYPES:

The type of feature depends on the type of system in which it will be implemented. In image processing, the most common types are spectral, geometric, and texture features.

Spectral characteristics When spectral features are used, the image is processed as a pixel matrix. Each of these represents the brightness and colour level found in the image at the corresponding location.

Color space is the most basic type of spectral feature in which we are interested in the colour distribution across the image. Color moments and colour sets are two examples of such techniques.

In addition to these fundamental techniques, others have been developed in which the image is segmented into smaller sections and feature extraction techniques are applied separately to each segment. **Shape Characteristics** One of the most fundamental issues in image.

Texture characteristics Texture features are visual patterns with homogeneous properties that do not result from the presence of a single colour or intensity. These characteristics provide crucial information about the structural arrangement of surfaces and their relationship to the surrounding environment.

Segmentation is a critical technique that allows the same techniques to be used on a wide range of image types and sizes.

The only difference between images of different sizes is the number of segments in to which it is divided – number of steps necessary to process the whole image. Segmentation also provides better computational result T because processes use less time because they work with smaller amount of data.

III. SYSTEM ARCHITECTURE

The entire process can be depicted using these basic steps:

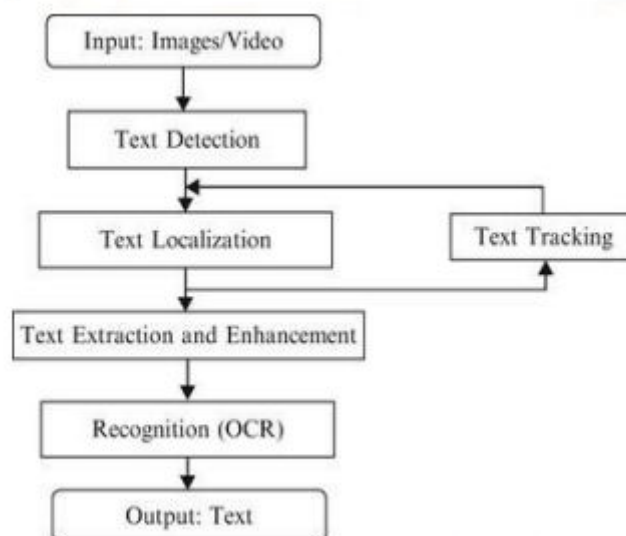


Figure: Workflow in the system

The three basic steps involved in this process are detection, enhancement and extraction. This diagram defines the structure of the system.

IV. CONCLUSION

Image processing is a highly developed and widely used technology. Feature retrieval techniques aid in making the process of identifying objects faster and more reliable. This project provided a high-level overview of current techniques. The application has reached a stable state in which all bugs have been eliminated. The application is being worked on at a high level of proficiency. The problem is resolved by the application. It was intended to address a specific need. The upward trend is almost certain to continue in the future. Image processing is used in mill floor quality assurance systems, image sweetening, and satellite intelligence systems to recognise photographs. We can sharpen photos, distinguish them to create a more effective graphic display, reduce the amount of memory required for storing image definite motion, and soon, reduce the amount of memory required for storing image certain motion using image processing techniques. As a result of the preceding discussion, we can conclude that this subject has far more advantages than disadvantages, and as a result, it is beneficial in a variety of sectors.



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Impact Factor: 8.118



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