

DESIGN FOR VISITOR AUTHENTICATION BASED ON FACE RECOGNITION TECHNOLOGY USING CCTV

PROJECT REPORT

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In partial fulfilment for the award of the degree

of

Bachelor of Engineering

in

Electronics and Communication Engineering



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ABSTRACT

As part of the visitor authentication system's design, CCTV cameras are utilized to capture visitors' faces, and facial recognition software is then used to confirm the visitors' identities. The technology aims to improve security measures and make it easier for visitors to register. A few of the system's components include CCTV cameras, a facial recognition algorithm, a visitor authorization database, and a visitor registration system. When a visitor arrives, they are requested to take a selfie in front of the CCTV camera. The positioning of the CCTV cameras, the calibre of the cameras and face recognition algorithm, and the design of the visitor registration system are only a few of the factors taken an account throughout the system's development. For the privacy of visitors' personal information to be protected, the system must be dependable, precise, and able to distinguish faces in a variety of lighting situations and angles. Security systems and home services that use biometric data like fingerprints, iris scans, and face recognition are garnering attention as deep learning-based image recognition technology has advanced dramatically. YOLOv3 model-based real-time image processing technique is used to recognise faces in images. Visitor authentication is used to train a database of face photos of frequent visitors, and when a face is recognised, the system immediately sends a permission alert.

Keywords: OpenCV, Face Recognition, Closed-circuit Television, YOLO algorithm, Deep learning.

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LIST OF ABBREVIATION

S.No.	Abbreviation	Description
1.	AI	Artificial Intelligence
2.	YOLO	You Only Look Once
3.	CCTV	Closed Circuit Television
4.	CNN	Convolutional Neural Network
5.	SVM	Support Vector Machine

CHAPTER 1

INTRODUCTION

The use of facial recognition technology has grown across several industries, including visitor management, security, and attendance systems. Using face recognition technology for visitor verification offers a dependable and effective way to control visitors' access to restricted areas. In this project, we suggest a face recognition-based visitor authentication scheme that makes use of the OpenCV library. The three key elements of the suggested system are visitor authentication, face detection, and face recognition. The Haar Cascade classifier is used by the face detection module to find faces in the input picture or video stream. The OpenCV algorithm is used by the face recognition module to extract features from observed faces and identify them using a database of previously trained faces. Using the identified face as a benchmark, the visitor authentication module. As the need for security spreads around the world, many smart home services using CCTV (Closed-circuit Television) are being installed and operated. According to a report by the global statistics site Statista the global smart home security market is expected to increase from \$9,903 million in 2017 to \$35,619 million in 2024, with its compound annual growth rate (CAGR) increasing by 20.1%. In particular, CCTV in smart home services has the additional functions of automatically applying user access controls, automatically searching the surroundings at a determined time, tracking a target, and increasing image resolution.

1.1 DEEP LEARNING

Deep learning is an artificial intelligence (AI) technique that instructs computers to interpret data in a manner that is similar to the way the human brain does. In order to generate precise insights and predictions, deep learning models can identify intricate patterns in images, text, sounds, and other data. Deep learning is a technique used in machine learning and artificial intelligence that mimics certain aspects of human cognition in order to scare individuals and influence their behaviour. It is a key component of data science to model based on data-driven methods using predictive modelling and statistics. Strong forces, which we commonly refer to as algorithms, are required to propel such a human-like capacity for adaptation, learning, and functioning appropriately.

1.1.1 Application of Deep learning

Applications for deep learning are employed in a variety of fields, including automated driving and medical equipment. **Automatic Driving:** To automatically detect items like stop signs and traffic signals, automotive experts are employing deep learning. Deep learning is also used to identify pedestrians, which reduces accidents.

Aerospace and Defense: Deep learning is used to find satellite-observed things of interest and to classify areas as safe or risky for troops. **Medical Research:** To automatically identify cancer cells, researchers studying cancer are utilising deep learning. Researchers at UCLA developed a sophisticated microscope that produces a high-dimensional dataset used to train a deep learning programme to correctly identify cancer cells.

Industrial Automation: By automatically recognising when individuals or things are too close to heavy machinery, deep learning is improving worker safety around such equipment.

Electronics: Automatic speech and hearing translation uses deep learning. For instance, deep learning software powers home help gadgets that recognise your voice and preferences.

1.1.2 Deep Learning Works

Deep learning models are sometimes referred to as deep neural networks because the majority of deep learning techniques use neural network topologies. In most cases, "deep" refers to the number of neural network's hidden layers. Traditional neural networks only have 2 or 3 hidden levels, whereas deep networks may contain 150 hidden layers. Large datasets of labelled data, neural network topologies that automatically extract features from the data while learning them from data are used in training deep learning models. Neural networks are among the most popular deep learning models(CNN or Convent). The CNN architecture is particularly suited to processing 2D data, such as images, because it convolves learnt features with input data and utilises 2D convolution layers. While CNNs do not require manual feature extraction, you do not need to be aware of the features that are used to categorise photographs using them. With the help of tens or hundreds of hidden layers, CNNs can learn to recognise various elements in an image. The intricacy of the figured-out visual features grows with each hidden layer. For instance, the first hidden layer may learn how to recognise edges, and the last hidden layer could learn how to recognise more intricate shapes tailored to the geometry of the object we are trying to recognise. The type of machine learning known as "deep learning" is specialised. Relevant features from photos are manually extracted to form the basis of a machine learning approach. These characteristics help create a model that uses the data to categorise the objects in the image. A deep learning approach is used to automatically extract pertinent information from pictures. Moreover, deep learning accomplishes "end-to-end learning, "where raw data and a task are given to a network to accomplish, like classification, and it automatically learns how to do it. Another significant difference is that deep learning techniques scale with data, whereas shallow learning approaches converge. When you add additional samples and training data to the network, "shallow learning" machine learning approaches hit their performance limit. Deep learning networks typically improve as the amount of your data increases, which is a significant advantage. The top three ways that deep learning is used to categorise items.

1.2 IMAGE PROCESSOR

An image processor performs the tasks of image capture, storage, pre-processing, segmentation, representation, recognition, and interpretation before displaying or recording the finished image. The process begins with picture acquisition, which is done by an imaging sensor working with a digitizer to digitise the image, as shown in the diagram. The following phase is pre-processing, where image is enhanced before being provided as a input to the subsequent procedures. Pre-processing often involves improving, eliminating noise, isolating regions, etc. An image is segmented into its individual elements or components. The result of segmentation is often raw pixel data, which either includes the region's border or the region's individual pixels. The act of translating a raw pixel into a representation is called representation.

1.3 FACE RECOGNITION

Since it is the most natural procedure for human identity, it is the least intrusive method, and yet it still remains the most challenging modality, face recognition tends to be the most alluring visitor authentication. Face detection and feature extraction are the first steps in a face recognition or authentication system and are required to identify the face location and extract the facial features from the image for further processing. The crucial phase of facial recognition or authentication is when the features gathered are then used. Because there are so many different faces that can be taken into consideration and because there are so many different situations and methods for taking pictures of these faces, researchers continue to face difficulties in the recognition or authentication process because of this feature extraction. Face detection technology automatically detects faces, and without touching any hardware, the entire face identification process is accomplished. The face recognition system's initial stage is face detection. The accuracy of face detection affects how well the complete face recognition system performs. Face detection allows it to solely recognise the facial portion of an image, regardless of the background. The Viola-Jones face detection algorithm is employed in this system. Instead of scaling the

input image, Viola-Jones scales the detector and runs it repeatedly through the image, each time with a new size. A scale-invariant detector created by Viola-Jones uses the same amount of calculations regardless of size.

1.4 OpenCV

OpenCV (Open Source Computer Vision) is an open-source collection of computer vision and machine learning approaches created to assist developers in building software that can analyse and comprehend visual data from the environment. It was initially created by Intel in the late 1990s, and a development community currently looks after it. Wide-ranging features are offered by OpenCV, including processing of images and videos, feature identification, object recognition and tracking, camera calibration, and more. It is appropriate with Windows, Linux, macOS, iOS, and Android and supports a number of programming languages, including C++, Python, Java, and MATLAB. With its extensive library of pre-built functions and algorithms, OpenCV can be used in a variety of fields, including robotics, autonomous vehicles, surveillance systems, medical imaging, and more. Its ease of use and flexibility make it a popular choice for developers and researchers operating in the computer vision industry.

1.5 YOLO

Joseph Redmon, Ali Farhadi, and others introduced the object detection method YOLO (You Only Look Once) in 2016. It is a cutting-edge object detection algorithm renowned for its quickness and precision. You Only Look Once (YOLO) is an object detection technique that, in contrast to conventional object detection algorithms, only looks at the full image once to identify objects. The YOLO method predicts bounding boxes and class probabilities for each cell by dividing the image into a grid of cells. Afterwards, these bounding boxes are modified in accordance with the anticipated offsets, and all cell forecasts are added together to get the final projections. Among the major advantages of YOLO is its speed. YOLO can process images in real-time, which is critical for

applications like self-driving cars and surveillance systems. Another advantage is its accuracy, as YOLO can detect objects with high precision and recall rates. YOLO has been widely adopted and has evolved over time. Presently there are three versions of YOLO: YOLOv1, YOLOv2, and YOLOv3. Each version has improvements over the previous version, such as better accuracy, faster processing, and more features. YOLO has been used in a wide range of applications, including autonomous driving, robotics, surveillance systems, and more. Its speed and accuracy make it a popular choice for real-time applications that require object detection.

CHAPTER 2

LITERATURE SURVEY

2.1 TITLE: Research on Face Recognition Technology Based on PCA and SVM

AUTHOR: Yan Wang Qinglin Wu

YEAR:2022

DESCRIPTION: In the study of artificial intelligence and pattern identification, face recognition is a prominent topic. Face samples can be used by machine learning algorithms to identify whether they belong to a specific category. This paper explains the fundamental idea and procedure of face recognition and proposes a face recognition method based on PCA and SVM, which is based on the discussion and analysis of PCA and SVM technology. The LFW (labelled faces in the wild) face data collection is utilised to detect faces using this method, and the parameter adjuster grid search cv is used to further increase the recall and precision of face recognition. According to the experimental findings, face recognition technology based on PCA and SVM not only shrinks the face's dimension

2.2 TITLE: Occlusion Resistant Face Detection and Recognition System

AUTHOR: An-Chao Tsai; Yang-Yen Ou

YEAR:2020

DESCRIPTION: With the development of deep learning techniques and the creation of hardware processors for accelerating neural networks, facial recognition applications are growing in popularity. The accuracy of face recognition is easily impacted by light, distance, and occlusion. The occlusion, however, is the most challenging problem to resolve. In this study, a convolutional neural network can capture facial features and was trained to increase face detection accuracy is presented. The suggested approach fixes the issue when the face is also covered by an obstruction. The face detection network calculates all of the face regions and facial landmarks for the input image. Following facial landmark alignment, face is entered into face recognition network for identification.

2.3 TITLE: Face Recognition from Partial Face Data

AUTHOR: Safa Alfattama; Priyadarshi Kanungo

YEAR: 2021

DESCRIPTION: During spread of the Corona epidemic, everyone started wearing masks as protection in public places. Therefore, this causes a major challenge in authentication and safety systems, such as face recognition systems in railway stations, airports, and payment systems based on facial recognition technologies. Face recognition systems are safer than touch-based biometric systems. Though the face recognition systems are ineffective in the presence of a face with a mask. Therefore, we developed an efficient algorithm using the MTCNN and VGGF model to improve the efficacy of face recognition systems in partially occluded face images. The top half of the facial images created by the suggested method has 90% accuracy.

2.4 TITLE: Face Recognition based Artificial Intelligence With AttendX Technology for Student Attendance

AUTHOR: Ageng Setiani Rafika; Sudaryono

YEAR:2022

DESCRIPTION: A facial recognition system is used by the platform AttendX to take attendance. For agencies or organisations with existing attendance systems, AttendX is a solution. Due to its characteristics, AttendX can streamline attendance processes and make it simpler for users to attend. Only the user's face (left, right, front side, while wearing a mask) and a brief bio are needed to register AttendX. AttendX provides the ability to authenticate the user's face when they register and are saved in the database. This application uses quick facial recognition technology in its design. AttendX can be used to address the current issue by halting the propagation of the covid-19 virus because it can identify a user's face even while they are hiding it behind a mask.

2.5 TITLE: Application Analysis of Face Recognition Technology Based on Computer Vision

AUTHOR: Chenran Liu; Junting Liu

YEAR:2021

DESCRIPTION: The need for quick and accurate automatic identification verification is growing more critical for all stakeholders as society develops. As biological traits are inherent to humans, they offer a high degree of individuality and stability, making them the perfect foundation for identity verification. Face recognition is easier for users to accept and more straightforward than other biometrics like fingerprints and iris scans. Face recognition is now a hot topic for research in the fields of pattern recognition and artificial intelligence as a result. The study of face detection and recognition technologies is crucial to human-computer interaction and has significant theoretical and practical implications. Both the face identification algorithm based on the embedded facial image and the face detection approach based on skin colour information.

2.6 TITLE: Cloud-Based Face and Speech Recognition for Access Control Applications

AUTHOR: Nathalie Tkauc; Thao Tran

YEAR: 2020

DESCRIPTION: : This paper presents the implementation of a system that uses speech-to-text recognition and face photos to identify employees and visitors trying to enter a physical office. With the aid of face recognition, the technology enables employees to enter without using tag-keys or cards. An employee is sent a randomly generated code, which must be entered into the screen in order to prevent spoofing attacks and boost security. But, visitors and delivery personnel can use a speech-to-text service to instantly send a notification to the correct staff by simply saying the name of the individual they wish to meet. The system's hardware is made up of two Raspberry Pi, a 7-inch LCD touch screen

2.7 TITLE: Person identification in low resolution CCTV footage using deep learning

AUTHOR: Sumantu Powale; Abhijeet Dhanawade

YEAR: 2020

DESCRIPTION: The advancement of camera technology, high-speed networking, and the accessibility of a great amount of information across media allowed for the creation of improved algorithms for human recognition. It is still challenging to identify a human in CCTV cameras with low resolution. In this study, a person may be recognised in low-resolution webcam images or in several frames of CCTV footage using a deep learning convolutional neural network (CNN). The suggested technique performs this function utilising a facial image of a person. The proposed CNN pipeline consists of six convolutional layers, one flattened layer, and two fully linked layers. A total of 6667 images from 62 subjects were used to train and validate the CNN framework over the course of 500 epochs. The created CNN finished training with an accuracy rate of 99.99% and 98.45%.

2.8 TITLE: Face Detection and Recognition in Near Infra-Red Image

AUTHOR: Athreya V Shet; Chinmay BS

YEAR: 2022

DESCRIPTION: Face detection and recognition is an extensively researched topic in Artificial Intelligence. The use of AI in detection and mapping of faces or any objects can reduce the time spent in video auditing. A face recognition system maps facial traits from a picture or video using biometrics. To identify a match, it compares the data with a database of recognized faces. In any situation, facial recognition technology can intelligently assist in confirming a person's identification. Infra-Red camera or night vision in security cameras uses infrared light to capture near-infrared images in the dark and also through fog, dust and smoke, such that camera works in all conditions. Visual spectrum cameras only function optimally when the picture capture process is efficient, but infrared cameras may always provide high-quality photos. The study describes our efforts to develop a facial recognition system using near-infrared images from a security

camera. A database of real-time Close Circuit Television footage of various people was created, and the same was tested using various face detection methods. Images were classified using facial embeddings from the VGG-face model to identify faces.

2.9 TITLE: Face Mask Detection using CNN

AUTHOR: G. Saranya; Dipshikha Sarkar

YEAR:2021

DESCRIPTION: An essential component of computer vision is face recognition. It is used to find faces, identify people, and confirm that the identification is accurate. Facial recognition technology is crucial to our daily lives and is used for a variety of applications, including passport checks, smart doors, access control, voter verification, criminal investigations, and systems to secure public spaces like parks, airports, bus terminals, and train stations. Everyone must wear a mask during times of pandemic and post-pandemic scenarios in order to stop the corona virus from spreading. As a result, the typical facial recognition systems that are now in use are ineffective. So, it is necessary to improve the current processes to achieve the desired outcomes and find the hidden face as soon as possible. Three processes—image pre-processing, picture detection, and image classification—make up the operation of this system. The main goal is to determine if a person's face is hidden by a mask or not based on webcam or CCTV camera footage. It keeps on verifying if a person is wearing mask or not. Convolutional Neural Network (CNN) and Caffe models are employed for categorization, feature extraction, and detection of the masked faces. They provide the rapid, very accurate, and highly secure detection of masked faces.

2.10 TITLE: Classroom Attendance Monitoring Using CCTV

AUTHOR: Muthunagai. R; Muruganandhan. D

YEAR:2020

DESCRIPTION: : At institutions and schools, maintaining attendance is a crucial task for the faculty in order to assess a class's strength. The faculties receive paper-based attendance records. They each have one for different time periods and established log book topics. Every time they attend class for their periods, they record their attendance. Modern manual paper-based attendance methods should be replaced with intelligent attendance tracking systems, such as biometric facial recognition systems. It is widely utilised in many applications, including keeping accurate attendance records, computer-human interaction, class room surveillance, and security concerns. This solution fixes the issues with recording students as absent even when they are present in the classroom.

CHAPTER 3

SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

The existing system for visitor authentication typically involves manual methods such as presenting identification documents and signing visitor logs. These methods are time-consuming, error-prone, and do not provide a high level of security. CCTV cameras may be used to monitor the entrance and exit of visitors, but they do not provide a means of authentication.

The CCTV can record the situation outside a building or in the absence of people and transmit this information to the user. Thus, it is frequently utilised for the purpose of crime prevention, facility safety, and fire detection. As artificial intelligence (AI) has developed, systems that have introduced intelligent object recognition technology have been continuously studied. In existing system password authentication scheme has been implemented in existing system model algorithm

3.2 DISADVANTAGE

- Predicting accuracy low
- Difficult to confirm whether a targeted object is a person or not
- There is a limit to responding to the situation even when a person is recognized

CHAPTER 4

EXPERIMENTAL PROCEDURE

4.1 PROPOSED SYSTEM

Identification and authentication are crucial for confirming that users have the necessary permissions and access to a given piece of information. There are four methods for identifying users. ID/password-based authentication is a widely used, straightforward, and practical type of user authentication. Techniques for password authentication Then, it compares the hash value of the original password provided at the time of registration to the hash value of the submitted password. The administration of the database (DB) where passwords are stored has an impact on the security of password-based authentication. In multiple instances, attackers with insider connections have obtained user passwords by accessing a member information table that contained member information. In most cases, the user-registered password is not kept in the database. We offer a system that can detect visitors using AI technology and give services based on the circumstances. To decide whether or not a human face is identified, the suggested system employs You Only Look Once (YOLO) and OpenCV with picture input from the CCTV camera in front of the door. This system may send users an alert signal when it detects an outsider next to or behind the registered individual.

4.2 ADVANTAGE

- A low cost since it is stand alone and not server -based.
- High accuracy.
- High recognition.
- Safe from various attacks, provided convenience, and allowed visitor authentication.

4.3 BLOCK DIAGRAM

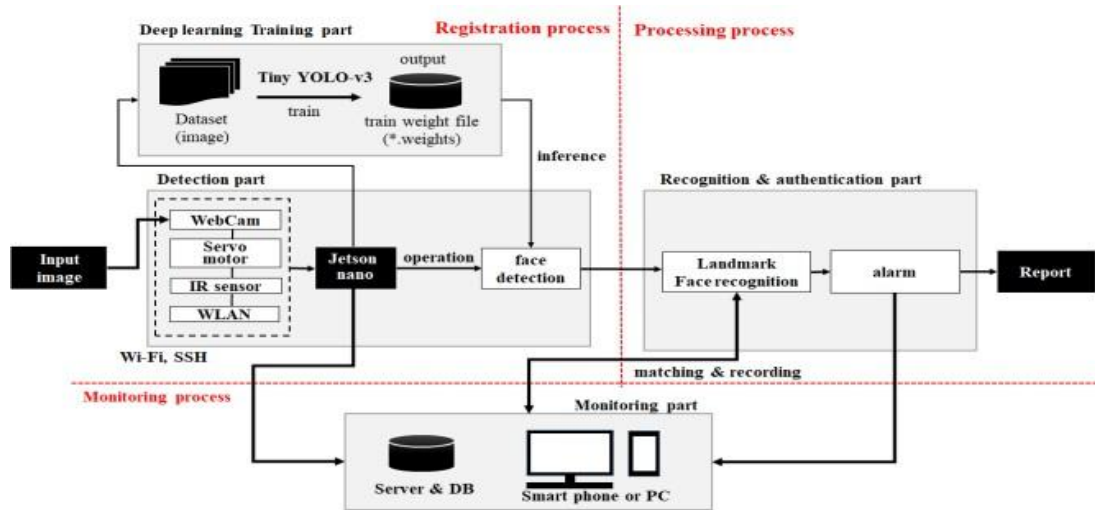


Figure 4.1

Refer figure 4.1:

- Input Image : The first component is a CCTV camera that captures the visitor's face.
- Face Recognition Module: The second component is a face recognition module that analyzes the captured image and compares it with the database of authorized visitors.
- Database: The third component is a database that stores the information of authorized visitors along with their corresponding facial features.
- Access Control: The fourth component is an access control system that grants or denies access based on the result of the face recognition module.

When a visitor arrives, the CCTV camera captures their face, which is then analyzed by the face recognition module. If the visitor's face matches with the information stored in the database, the access control system grants them access. Otherwise, access is denied. The system can be used to enhance security in buildings or public areas by ensuring that only authorized individuals are granted access.

CHAPTER 5

SYSTEM REQUIREMENT

5.1 H/W SYSTEM CONFIGURATION:-

- Processor - Pentium –IV
- RAM - 4 GB (min)
- Hard Disk - 20 GB

5.2 S/W SYSTEM CONFIGURATION:-

- Operating System : Windows 10
- Tools: python, Jupiter notebook, anaconda tool, atom.
- Language: python, HTML, Bootstrap, CSS

5.3 SOFTWARE ENVIRONMENT

5.3.1 Python Technology:

Python is an interpreter-based high-level general-purpose programming language. The procedural, object-oriented, and functional programming paradigms are all supported. Python is commonly referred to as a "batteries included" language because of its vast standard library.

5.3.2 Python Programming Language:

A multi-paradigm programming language is Python. Its various features completely enable functional programming, aspect-oriented programming, object-oriented programming, structured programming, meta programming, and met objects (magic methods). Numerous additional paradigms, like design by contract and logic programming, have extensions available.

Python packages with a wide range of functionality, including:

- Easy to Learn and Use

- Expressive Language
- Interpreted Language
- Cross-platform Language
- Free and Open Source
- Object-Oriented Language
- Extensible
- Large Standard Library
- GUI Programming Support
- Integrated
- Python's memory management system combines reference counting and a cycle-detecting garbage collector with dynamic typing. Moreover, it has a dynamic name resolution (late binding) capability that binds variable and method names as the program is being run.
- Python was made to be very extendable rather than having all of its features included in its core. It is especially well-liked for adding programmable interfaces to already-existing applications because of its compact modularity. Van Rossum's dissatisfaction with ABC. The opposite strategy led to his concept of a tiny core language with a huge standard library and easily expandable interpreter.
- Python is designed to be a language that is simple to read. Its formatting is visually clean and frequently substitutes English keywords. It differs from many other languages in that blocks are not delimited by curly brackets, and the use of semicolons to end statements is optional. Compared to C or Pascal, There are fewer syntactic exceptions and unique situations in it.

A repository architecture for an IDE

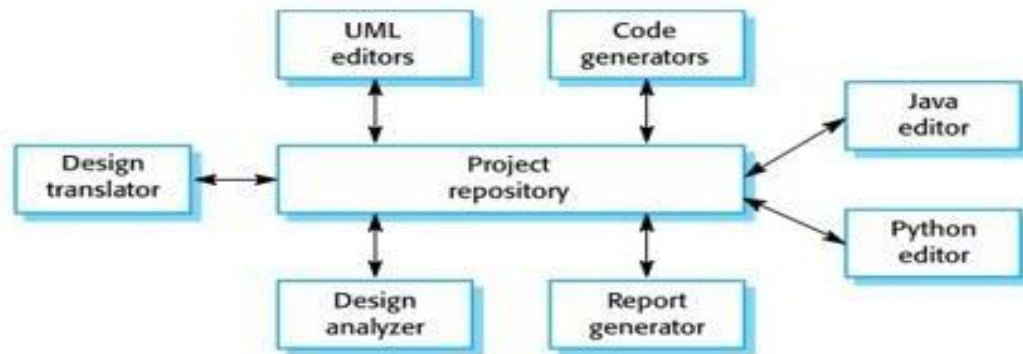


Figure 5.1

By offering developers an option in their coding approach, Python aims towards a simpler, less crowded syntax and grammar. Python adheres to the design tenet that "there should be one and preferably only one obvious way to do it," in contrast to Perl's "there is more than one way to do it" maxim. According to Alex Martelli, a Fellow at the Python Software Foundation and author of a Python book "In the Python culture, in Figure 5.2

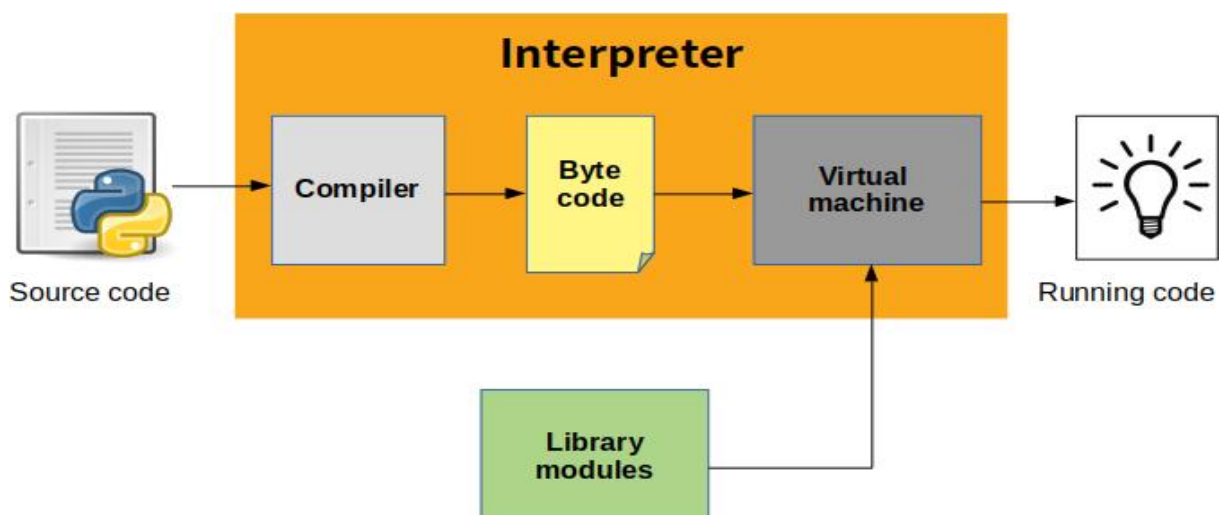


Figure 5.2

call something "clever" is not regarded as a compliment.". The developers of Python try to prevent over-optimization and reject changes to non-critical areas of the Python reference implementation that might result in slight speedups at the expense of clarity. The developers of Python prioritise keeping the language enjoyable to use. This is reflected in the language's name, which pays homage to the British comedy group Monty Python, as well as in its sometimes lighthearted approach to tutorials and reference materials, as seen in the use of examples like spam and eggs (from a well-known Monty Python sketch) rather than the more conventional foo and bar.

5.3.3 The Python Platform:

To obtain information on the platform's underpinnings, such as specifics on the hardware, operating system, and interpreter version, utilise Python's platform module. The platform module contains tools for viewing details about the hardware, operating system, and interpreter version of the platform on which the programme is running. There are four routines that can be used to determine the current Python interpreter. The `python` version function and `python version` tuple provide different ways to return Python's major, minor, and patch level components. The Python compiler is reported by the function `python compiler`. Moreover, `python build` returns a version string for the interpreter's build. `Platform` returns string containing a general purpose platform identifier. The function accepts two optional Boolean arguments. If `aliased` is true, the names in the return value are converted from a formal name to their more common form. When `terse` is true, returns a minimal value with some parts dropped.

What does python technology do?

Python is very well-liked by programmers, but actual usage demonstrates that business owners also believe in Python development, and for good reason. Its reputation as one of the simplest programming languages to learn and its simple syntax make it a favourite among software engineers. The fact that there is a framework for almost everything, from web apps to machine learning, is appreciated by business owners or CTOs.

Yet, it was developed mainly as a technology platform by a massive collaboration amongst hundreds of independent professional developers who came together to establish a sizable and unusual community of enthusiasts.

What specific advantages does the language offer individuals who chose to adopt it as their primary technology, then? Here are only a few of them justifications.

5.4 PRODUCTIVITY AND SPEED

It is a widespread theory within development circles that developing Python applications is approximately up to 10 times faster than developing the same application in Java or C/C++. The impressive benefit in terms of time saving can be explained by the clean object-oriented design, enhanced process control capabilities, and strong integration and text processing capacities. Moreover, its own unit testing framework contributes substantially to its speed and productivity.

5.5 PYTHON IS POPULAR FOR WEB APPS

Web development shows no signs of slowing down, so technologies for rapid and productive web development still prevail within the market. Along with JavaScript and Ruby, Python, with its most popular web framework Django, has great support for building web apps and is rather popular within the web development community.

5.6 OPEN-SOURCE AND FRIENDLY COMMUNITY

As stated on the official website, it is developed under an OSI-approved open source license, making it freely usable and distributable. Additionally, the development is driven by the community, actively participating and organizing conference, meet-ups, hackathons, etc. fostering friendliness and knowledge-sharing.

5.7 PYTHON IS QUICK TO LEARN

It is said that the language is relatively simple so you can get pretty quick results without actually wasting too much time on constant improvements and digging into the complex engineering insights of the technology. Even though Python programmers are really in high demand these days, its friendliness and attractiveness only help to increase number of those eager to master this programming language.

5.8 BROAD APPLICATION

It is used for the broadest spectrum of activities and applications for nearly all possible industries. It ranges from simple automation tasks to gaming, web development, and even complex enterprise systems. These are the areas where this technology is still the king with no or little competence:

- Machine learning as it has a plethora of libraries implementing machine learning algorithms.
- Web development as it provides back end for a website or an app.
- Cloud computing as Python is also known to be among one of the most popular cloud-enabled languages even used by Google in numerous enterprise-level software apps.
- Scripting.
- Desktop GUI applications.

5.8.1 Python compiler

Python source code analysis and Python bytecode generation are both supported by the Python compiler package. The compiler comes with modules that can create an abstract syntax tree from Python source code and then convert the tree to Python bytecode. The compiler package offers translation from Python source to bytecode. Using the standard parser module and the built-in parser, it produces a concrete syntax tree. This tree is used to create an abstract syntax tree (AST), which is followed by Python bytecode. The whole

functionality of the package essentially duplicates the built-in compiler included with the Python interpreter. Its behaviour is meant to be as close to a match as possible. Why create a different compiler that performs the same function? The package serves a number of objectives.

5.8.2 The basic interface

The package's top level specifies four functions. These routines and the collection of modules contained in the package will be available if you import compiler.

compiler.parse(buf)

Brings back an abstract syntax tree for the buf source of Python. If there is a syntax mistake in the source code, the function raises Syntax Error. A compiler.ast. Module instance with the tree is the return value.

compiler.parseFile(path)

For the Python source code in the path-specified file, return the abstract syntax tree. It is the same as parse(open (path). read()).

5.9 LIMITATIONS

There are some issues with the compiler package's error checking. The interpreter looks for syntax mistakes in two different stages. The parser of the interpreter finds one set of faults, and the compiler finds the other set. The earliest stages of error checking are provided free of charge to the compiler package because it depends on the interpreter's parser. It carries out the second phase on its own, but it does so insufficiently. For instance, if a name appears more than once in an argument list, the compiler package will not indicate an error: function f(x, x): These issues should be resolved in a later release of the compiler.

5.10 PYTHON ABSTRACT SYNTAX

The Python abstract syntax is specified by the compiler as module. Every node corresponds to a syntax element in the abstract syntax tree. Module object serves as the tree's main node. Python source code that has been parsed can be accessed at a higher level using the abstract syntax. A concrete syntax tree is used by the C-written parser module and compiler for the Python interpreter. The Python parser's grammar description and the concrete syntax are tightly related. Python's precedence rules frequently introduce multiple levels of nested nodes in place of a construct's single node. It is the compiler's job to build the abstract syntax tree. module for a transformer. The transformer creates a concrete syntax tree by using the Python parser that is already built-in.

5.11 AST NODES

Each node type and its elements are described in a text file that serves as the basis for the compiler.ast module's creation. Each type of node is represented by a class that derives from compiler.ast.Node, an abstract base class that specifies a number of named properties for child nodes.

class compiler.ast.Node

The parser generator automatically creates the Node objects. Use of the public properties to gain access to child nodes is the suggested interface for particular Node instances. Depending on the Node type, a public attribute may be attached to a single node or a series of nodes. For instance, the doc attribute is connected to a single node, and the bases attribute of the Class node is bound to a list of base class nodes. A line attribute is present in every Node object and it can be None. XXX Uncertain about the guidelines for determining which nodes will have a useful line.

5.11.1 All Node objects offer the following methods:

getChildren()

A flattened list of the child nodes and objects in the order of appearance is returned. In more detail, the nodes are arranged in the Python grammar in the order that they appear there. The children are not all Node instances. For instance, the names of functions and classes are simple strings.

getChildNodes()

A flattened list of the child nodes in the occurrence order is returned. The only difference between this function and `getChildren()` is that it only returns children that are Node objects. `Test`, `body`, and `else_` are the three characteristics of the `While` node. (A word that is a Python reserved word and the natural name of an attribute cannot both be used. To make a word a legal identifier, an underscore is added; thus, `else_` rather than `else`). Because the `if` statement can contain several tests, it is more difficult. The `If` node defines only two characteristics: `tests` and `else_`. The `tests` attribute consists of several test expression and subsequent body pairs. There is a pair for each `if/elseif` condition. The first element of the pair is the test expression. The code that will be executed if the test is successful is contained in a `Stmt` node, the second element. If's `getChildren()` method returns a flat list of child nodes. If there are three `if/elseif` clauses and no `else` clause, `getChildren()` will provide a list of six elements, including the first test expression, the first `Stmt`, the second test expression, etc. This is a list of all the public characteristics available on each instance of the Node subclasses described in `compiler.ast`. The majority of the characteristic values are either sequences of instances or specific Node objects. When the value is something other than an instance, the type is stated in the comment. In accordance with how `getChildren()` and `getChildNodes` return the attributes, they are listed in that sequence.

5.12 DEVELOPMENT ENVIRONMENTS:

The majority of Python implementations, including CPython, have a read-eval-print loop (REPL), which enables them to work as command line interpreters for which users submit commands sequentially and immediately receive responses. Further features like syntax highlighting, session state retention, and auto-completion are added by some shells, such as IDLE and IPython.

5.13 IMPLEMENTATIONS:

5.13.1 Reference implementation

The standard Python implementation is called CPython. It is written in C and includes a few specific C99 capabilities while adhering to the C89 standard. It creates intermediate bytecode from Python applications that is subsequently executed by its virtual machine. A sizable standard library created in a combination of C and native Python is included with the distribution of CPython. Several platforms, including Windows and the majority of contemporary Unix-like systems, support it. One of its initial goals was platform portability.

5.13.2 Other implementations

Python 2.7 and 3.5 have a quick, compliant interpreter called PyPy. Compared to CPython, it is significantly faster thanks to its just-in-time compiler, however some C libraries cannot be used with it. Stackless Because it doesn't use the C memory stack and provides microthreads, Python—a substantial offshoot of CPython—allows for massively concurrent programming. There is also a stackless version of PyPy. The Python 3 subsets MicroPython and CircuitPython were designed with microcontrollers in mind. Lego Mindstorms EV3 is one example of this. An interpreter for Python 3 developed in Rust is called RustPython.

5.13.3 Unsupported implementations

Although there are more just-in-time Python compilers, they are no longer supported: In 2009, Google started a project called Unladen Swallow with the goal of using LLVM to speed up the Python interpreter five times while also enhancing its multithreading scaling to thousands of cores, as opposed to the typical implementation's global interpreter lock.

Psyco is a just-in-time specialised compiler that is integrated with CPython and translates bytecode to machine code as needed. The generated code is quicker than standard Python code and is optimised for certain data types.

Nokia released PyS60, a Python interpreter, for the Series 60 of mobile phones in 2005. Together with some additional modules for interacting with the Symbian operating system, many modules from the CPython implementations are also supplied.

5.13.4 Cross-compilers to other languages

There are numerous high-level object language compilers that use either Python or a restricted subset of Python or a language that is similar to Python as the source language, depending on the compiler:

Jython enables the use of the Java class library from a Python program.

- IronPython follows a similar approach in order to run Python programs on the .NET Common Language Runtime.
- The RPython language can be compiled to C, and is used to build the PyPy interpreter of Python.
- Pyjs compiles Python to JavaScript.
- Cython compiles Python to C and C++.
- Numba uses LLVM to compile Python to machine code.
- Pythran compiles Python to C++.
- Somewhat dated Pyrex (latest release in 2010) and Shed Skin (latest release in 2013) compile to C and C++ respectively.
- Google's Grumpy compiles Python to Go.
- MyHDL compiles Python to VHDL.

- Nuitka compiles Python into C++.

5.14 PERFORMANCE

At EuroSciPy '13, a performance evaluation of different Python implementations on a non-numerical (combinatorial) task was presented.

5.15 API DOCUMENTATION GENERATORS

Python API documentation generators include:

- Sphinx
- Epydoc
- HeaderDoc
- Pydoc

5.16 USES

Numerous software programmes, including visual effects compositor Nuke, finite element method programmes like Abaqus, 3D parametric modellers like FreeCAD, 3D animation programmes like 3ds Max, Blender, Cinema 4D, Lightwave, Houdini, Maya, modo, MotionBuilder, and Softimage, and 2D imaging programmes like GIMP, Inkscape, Scribus, and Paint Shop Pro, have successfully incorporated Python as a scripting language. To display complicated structures like C++ containers, the GNU Debugger leverages Python as a beautiful printer. Python is suggested by Esri as the greatest scripting language for ArcGIS. Moreover, it has been utilised in various video games, and Google App Engine chose it as the first of the three programming languages it provides. A few libraries that are widely used with Python in artificial intelligence projects include TensorFlow, Keras, and Scikit-learn. Because of its modular architecture, simple syntax, and powerful text processing tools, Python is a well-known scripting language for NLP. An operating system that is frequently used and included is Python. Most Linux distributions, AmigaOS 4, FreeBSD, NetBSD, OpenBSD, and macOS preinstall it, and it can be used from the command line (terminal). Some Linux distributions employ

installers that were developed in Python; Ubuntu uses the Ubiquity installer, while Red Hat Linux and Fedora use the Anaconda installer. The Portage package manager in Gentoo Linux uses the programming language Python.

In the field of information security, Python is frequently used, especially for creating attacks.

The One Laptop per Child XO software was created by Sugar Labs mostly using the Python programming language. The main user-programming language for the Raspberry Pi single-board computer project has been decided upon: Python.

Python is a component of LibreOffice, which seeks to displace Java with it. With Version 4.0 on the 7th of February 2013, its Python Scripting Provider has become a key component.

5.17 PANDAS

Pandas is a Python software package made specifically for manipulating and analysing data in computer programming. It has particular methods and data structures for dealing with time series and mathematical tables. It is free software distributed under the BSD license's three clauses. The word is derived from "panel data," a phrase used in econometrics to refer to data sets that contain observations for the same persons throughout a range of time periods.

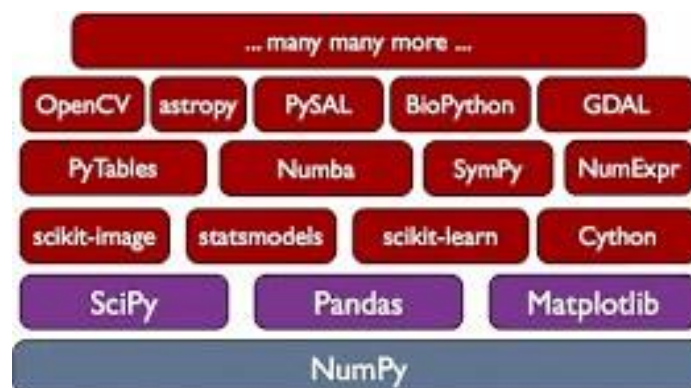


Figure 5.3 Library features

- Tools for reading and writing data across several file formats and in-memory data structures. a data frame object with built-in indexing for data manipulation.
- Data alignment and integrated missing data processing.
- Rearranging and rotating data sets.
- Subsetting of big data sets, clever indexing, and label-based slicing.
- Inserting and removing columns in a data structure.
- The ability to split-apply-combine data sets using the group by engine.
- Merging and connecting data sets.
- Handling high-dimensional data using hierarchical axis indexing in a lower-dimensional data structure. Data filtration is made possible by time series functionality, which includes date range generation, frequency conversion, moving window statistics, moving window linear regressions, date shifting, and lagging.

CHAPTER 6

TESTING AND RESULTS

6.1 SYSTEM TESTING

Testing is carried out to look for errors. Finding errors or vulnerabilities in a piece of work is the process of testing. It is the process of testing software to ensure that it satisfies user expectations and needs and does not malfunction in an unacceptable way. There are various test types. Each sort of test has a specific response to the testing requirement.

6.2 TYPES OF TESTS

6.2.1 Unit testing

Unit testing involves the creation of test cases to ensure that the internal programme logic is operating properly and that programme inputs lead to legitimate outputs. It is important to check the internal code flow and any decision branches. Individual tests are being conducted on the software for the application. Prior to integration, it is done following the completion of a single unit. This testing is intrusive, structural, and dependent on understanding how it was built. A particular business process, application, and/or system configuration are tested using unit tests, which carry out fundamental testing at the component level. Unit tests make assurance that each individual path of a business process adheres precisely to the stated specifications and has inputs and outputs that are well-defined.

6.2.2 Integration testing

Software components that have been merged are tested in integration tests to see if they genuinely operate as a single programme. Testing is event-driven and focuses more on the fundamental result of screens or fields. Even though the individual components were successful in unit testing, integration tests indicate that the combination of the components is accurate and consistent. Integration testing is especially designed to highlight issues

that result from combining components.

6.2.3 Functional test

Functional tests offer methodical proof that the functions being tested are available in accordance with the technical and business requirements, system documentation, and user manuals. Valid Input: Recognized valid input classes must be accepted.

Invalid Input: Defined categories of invalid input need to be rejected.

Functions: It is necessary to use the listed functions.

Output -specified kinds of application outputs must be exercised.

Systems/Procedures: It is necessary to call interacting systems or processes.

Functional test planning and preparation are centred on requirements, essential functions, or unique test cases. Moreover, testing must take into account systematic coverage of data fields, established procedures, and subsequent processes as well as business process flows. Before functional testing is finished, further tests are found, and the usefulness of the current tests is assessed.

6.2.4 System Test

System testing makes ensuring that the integrated software system as a whole complies with specifications. In order to provide known and predictable outcomes, it tests a setup. The configuration-oriented system integration test is an illustration of system testing. The foundation of system testing is process flows and descriptions, with a focus on pre-driven process connections and integration points.

6.2.5 White Box Testing

White box testing is a type of testing where the software tester is familiar with the inner workings, structure, and language of the software, or at the at least, knows what it is intended to do. It has a goal. It is employed to test regions that are inaccessible from a black box level.

6.2.6 Black Box Testing

Testing software in a "black box" is doing so without having any knowledge of the inner workings, architecture, or language of the module being tested. Black box tests, like the majority of other types of tests, must be created from a clear source document, such as a specification or requirements document. It is a type of testing where the software being tested is handled like a black box. It is impossible to "look" inside. Without taking into account how the software functions, the test generates inputs and responds to outputs.

6.2.7 Unit Testing

Although it is not unusual for coding and unit testing to be carried out as two separate phases, unit testing is typically undertaken as part of a combined code and unit test phase of the software lifecycle.

6.2.8 Test strategy and approach

Manual field testing will be done, and comprehensive functional tests will be prepared.

Test objectives

- Each field entry must function correctly.
- To activate pages, click the specified link.

There should be no delay in the entry screen, messages, or responses.

Features to be tested

- Make sure the entries are in the right format.
- It should be forbidden to enter more than once.
- The user should be directed to the correct page by each link.

6.2.9 Integration Testing

The incremental testing of two or more integrated software components on a single

platform known as "software integration testing" is done to induce failures brought on by interface flaws. The goal of an integration test is to ensure that software applications or components, such as those found in a software system or, in a higher level, software applications used by an entire firm, work together flawlessly.

Test Results: All of the aforementioned test cases were successful. There were no faults found.

6.2.10 Acceptance Testing

Approval by users Any project's testing phase is crucial and necessitates the end user's active involvement. Additionally, it makes sure the system satisfies the functional specifications.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

6.3 OUTPUT



Figure 6.1 Screenshot of Face Recognition

S. NO	ALGORITHM	ACCURACY
1	Existing System- YOLO V3	65%
2	Proposed \system - YOLO V7	71%

```
Run: security_detection x
C:\Users\jbala\AppData\Local\Programs\Python\Python37\python.exe D:\project\code\code\security_detection.py
Enter the pin_number : 152
Percentage match 63.64
[ WARN:0] global C:\projects\opencv-python\opencv\modules\videoio\src\cap_msmf.cpp (674) SourceReaderCB::~SourceReaderCB terminating async callback
Authorization Successful
Process finished with exit code 0
```

Figure 6.2 Screenshot of Image Authorization Successful

CHAPTER 7

CONCLUSION

In comparison to manual approaches, the facial recognition technology-based visitor verification offers a greater level of security, quicker authentication, and improved accuracy. Nonetheless, proper steps must be made to handle privacy issues, and technological problems must be closely watched to guarantee the system's accuracy. In general, the employment of face recognition technology is a potential approach for visitor verification in a variety of scenarios, such as corporate offices, governmental buildings, and other secure places. As it is used for voice recognition and picture recognition, deep learning—a key artificial intelligence technology—is expanding quickly. Deep learning technology in the area of image identification is specifically being used as a core technology in the burgeoning fields of autonomous driving and crime prevention monitoring systems. In particular, deep learning technology in the field of image recognition is being applied as a core technology to autonomous driving and crime prevention monitoring systems, which are emerging as future industries. As for deep learning models in the field of image recognition, various algorithms that have improved and developed CNNs capable of image processing have been proposed.

REFERENCES

- [1] A. Oumina, N. El Makhfi and M. Hamdi, "Control The COVID-19 Pandemic: Face Mask Detection Using Transfer Learning", *2020 IEEE 2nd International Conference on Electronics Control Optimization and Computer Science (ICECOCS)*, pp. 1-5, 2020.
- [2] G. T. S. Draughon, P. Sun and J. P. Lynch, "Implementation of a Computer Vision Framework for Tracking and Visualizing Face Mask Usage in Urban Environments", *2020 IEEE International Smart Cities Conference (ISC2)*, pp. 1-8, 2020.
- [3] J. Zheng, R. Ranjan, C. Chen, J. Chen, C. D. Castillo and R. Chellappa, "An Automatic System for Unconstrained Video-Based Face Recognition", *IEEE Transactions on Biometrics Behavior and Identity Science*, vol. 2, no. 3, pp. 194-209, July 2020
- [4] K. Muhammad, J. Ahmad, I. Mehmood, S. Rho, and S. W. Baik, "Convolutional neural networks based fire detection in surveillance videos," *IEEE Access*, vol. 6, pp. 18174–18183, 2018, doi:10.1109/ACCESS.2018.2812835
- [5] M. T. Bhatti, M. G. Khan, M. Aslam, and M. J. Fiaz, "Weapon detection in real-time CCTV videos using deep learning," *IEEE Access*, vol. 9, pp. 34366–34382, 2021, doi: 10.1109/ACCESS.2021.3059170.
- [6] O. Rudenko, O. Bezsonov and O. Romanyk, "Neural network time series prediction based on multilayer perceptron", *Development Management*, vol. 17, no. 1, pp. 23-34, 2019
- [7] T.-H. Tsai, C.-C. Huang, C.-H. Chang, and M. A. Hussain, "Design of wireless vision sensor network for smart home," *IEEE Access*, vol. 8, pp. 60455–60467, 2020, doi: 10.1109/ACCESS.2020.2982438.
- [8] R. Anand, T. Shanthi, M. Nithish and S. Lakshman, "Face recognition and classification using googlenet architecture" in *Soft Computing for Problem Solving*, Springer, pp. 261-269, 2020.
- [9] W. Chen, H. Huang, S. Peng et al., "YOLO-face: a real-time face detector", *Vis Comput*, vol. 37, pp. 805-813, 2021.
- [10] Y. Li, Y. Wang and D. Li, "Privacy-preserving lightweight face recognition", *Neurocomputing*, 2019.

APPENDICES

NAME:MOHAMED MOHAIDEEN A

ROLL NO: 191EC205

- 1) I have a major role in the initial planning of the project.
- 2) The previous work on our project were analysed and new modification were done.
- 3) I have analysed many research papers and it was helped in formulating the work flow of project.
- 4) All the referred materials were compiled and their advantages, advancement and the points of disadvantages were analysed and adopted
- 5) I have collected datasets 70% for training and 30% for testing.
- 6) I have done all the ppt works on our project and I helped to remove the plagiarism for the report.
- 7) I have a major role in taking contents for weekly process.
- 8) I have also helped in coding process and once we completed our project I have presented a paper in the conference.

NAME:VIKRAM M

ROLL N0: 191EC311

- 1).I have take part in training data sets.
- 2).Take part in analysing literature survey.
- 3).I have a major part in PPT works.
- 4).Have a role in initial planning of the project.
- 5).I have a major part in Report preparation.
- 6).I have take part in coding side.

NAME:VIJAY J

ROLL NO: 191EC310

- 1) I have take part in Coding side.
- 2) I had a part in analysing literature survey.
- 3)I am taking responsibility for conference.
- 4.Taking part in analysing the result.
- 5).Take part in training data sets.
- 6).Take part in preparing report.

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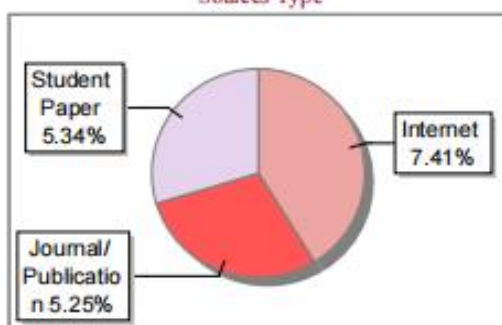
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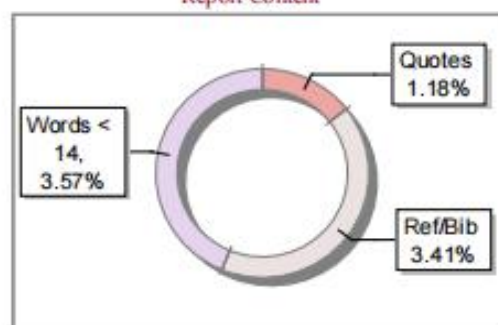
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2	REPOSITORY - Submitted to Jawaharlal Nehru Technological University (H) on 2023-02-23 14-28	4	Student Paper
3	Don Bosco College, Bangalore University By 17WJCMD023 - 2018, MRSA	1	Student Paper
4	index-of.es	1	Publication
5	ijircce.com	1	Publication
7	www.dx.doi.org	<1	Publication
8	brainly.in	<1	Internet Data
9	Detection of diseased pine trees in unmanned aerial vehicle images by using deep by Hu-2021	<1	Publication
10	moam.info	<1	Internet Data
11	www.pucsp.br	<1	Publication
13	index-of.es	<1	Publication
14	qdoc.tips	<1	Internet Data
16	www.sersc.org	<1	Publication

17	SpringerBriefs in Computer Science Image Processing and Computer Vision in iOS	<1	Publication
18	home.iitk.ac.in	<1	Publication
20	www.freepatentsonline.com	<1	Internet Data
21	Electronic CAD frameworks by Harrison-1990	<1	Publication
22	index-of.es	<1	Publication
23	REPOSITORY - Submitted to Jawaharlal Nehru Technological University (H) on 2023-02-25 12-42	<1	Student Paper
24	www.dx.doi.org	<1	Publication
25	Graphical One-Time Password (GOTPass) A usability evaluation by Alsaiani-2016	<1	Publication
26	sourcemaking.com	<1	Internet Data
27	www.ijitee.org	<1	Publication
28	eprints.rclis.org	<1	Publication
29	nlpwessex.org	<1	Internet Data
31	Handcuffed protectors Palestinian fatherhoodprotection unlocking its chains by Otman-2020	<1	Publication
32	pub.epsilon.slu.se	<1	Internet Data
33	www.businesswire.com	<1	Internet Data
34	247healthandwellness.com	<1	Internet Data
35	blog.ipleaders.in	<1	Internet Data
36	Computer assisted neurosurgery by Hagman-2012	<1	Publication

37	Dual-Stage Biometrics-Based Password Authentication Scheme Using Smart Cards by Boopathi-2017	<1	Publication
38	globalinvestigationsreview.com	<1	Internet Data
39	law.emory.edu	<1	Internet Data
40	Productivity of Information Systems in the Healthcare Industry by Niru-2000	<1	Publication
41	pt.slideshare.net	<1	Internet Data
42	qdoc.tips	<1	Internet Data
43	westmemphisfiredepartment.com	<1	Internet Data
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