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COLLEGE MANAGEMENT SYSTEM BASED ON ML

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Abstract
This work explores various opportunities to improvise regular tasks done by college faculty viz. student Registration, Exam, Notices, Result Analysis, Daily Student Attendance Analysis. A novel Face Detection and Recognition Student Attendance System is proposed to streamline administrative tasks and enhance classroom efficiency. As the administrator, I oversee the system'simplementation and functionality, facilitating seamless communication between teachers and students. Through the system, we can issue notices to both teachers and students, ensuring importantinformation reaches the intended recipients promptly. Additionally, teachers can utilize the systemfor conducting tests and promptly generating results, fostering an environment conducive to academic progress. By leveraging facial recognition technology, the system not only automates attendance tracking but also enhances security measures within the educational institution. Overall, this innovative system promises to revolutionize traditional administrative processes and promotea more dynamic learning environment.

Keywords:
Face Detection and Recognition, ML, OpenCV, CNN,MYSQL

1.Introduction

As a traditional approach, many of the lecturers in universities and colleges use conventional methods of pen and paper to mark a student's attendance. Also, Notice is sent using pen paper andcolleges official WhatsApp groups. Also, Analysis of results of internal and university exams turnsinto a tedious task if done manually. Also, the work aims to reduce unnecessary paperwork underthese factors. The proposed system consists of three primary modules namely Exam Result Analysis, Daily Student Attendance Analysis and Notices. For Exam Result Analysis module. Meanwhile, teachers can leverage the system to conduct tests and promptly access results, promoting a dynamic learning environment. This can be helpful to learn capabilities of a student based on their performance and individual statistics of the same for the recommendation of furtherefforts to be taken by instructors and students. For Student Attendance Analysis module, by harnessing the power of facial recognition, this system not only optimizes attendance tracking butalso cultivates a technologically advanced educational ecosystem. Its implementation underscores the commitment to leveraging cutting-edge technologies for the betterment of educational practices, ultimately fostering enhanced engagement and productivity within the academic community[1]. For Notice module, this system serves as a seamless interface between administrators, teachers, and students, enhancing communication and streamlining administrative tasks. Administrators can disseminate notices to both teachers and students, ensuring timely and effectivecommunication of important information.

1.1 Objectives

1.The College Management System is to manage the details of College, Faculty, Course, Batch.
2.It manages all the information about College, Student, Session, College.
3. The Project is totally built at administrative end thus only the administrator is guaranteed the access.

2. Literature review

Authors in [2] proposed the development of Online Intranet College Management Systems (CMS). This review encompasses research and academic contributions relevant to educational institutions and colleges, with a particular focus on systems deployed in engineering colleges. The surveyed literature addresses key aspects, including the intranet-based nature of such applications, user registration processes, permission structures, attendance monitoring, information retrieval, data modification, and knowledge/information management. Additionally, insights into the usability of the system for both technical and non-technical users, department-specific access, and security measures are explored. By synthesizing insights from diverse sources, the literature review provides a foundation for understanding the current landscape, identifying gaps, and informing the development and enhancement of effective CMS solutions tailored to the unique needs of engineering colleges.

Authors in [5] proposed The Student Information Management system aims to establish a cohesive information technology environment for students, HOD, faculty, staff, and administration. Our primary objective is to enhance services and streamline integration for end users. This web-based self-service platform caters to students, prospective students, and employees, serving as an administrative transaction processing system for annual admissions and an informative tool for faculty and staff at all levels to conduct reporting, data extraction, and information analysis. Specifically designed for educational institutions, it simplifies student data management and provides easy access to associated information for daily navigation. With features for entering test scores, creating student schedules, monitoring attendance, and managing various student-related data, this integrated college administration application is user-friendly and efficient, allowing users to focus on practical activities rather than administrative tasks. The system is capable of processing and generating accurate reports promptly.

The automated attendance system model proposed by the authors in [3] integrates face recognition with Radio Frequency Identification (RFID) to identify authorized students and track their entry and exit from the classroom. It maintains accurate records of all registered students, including data specific to each student enrolled in a particular course in the attendance log, offering relevant information as required.

In this study [4], the researchers developed and executed a system for tracking attendance using iris biometrics. Initially, participants were required to input their information along with their distinct iris template. During attendance, the system autonomously recorded attendance by capturing the iris image of each participant, identifying their iris, and cross-referencing it with the established database. The prototype operated through a web interface.

2.1 Existing system

The system which is used currently has some downsides which need to be bettered for better performance. The system through which the feedback is taken isn't good enough. The views of each and every Student aren't expressed through these systems. As technology is developed day by day, we need to use this technology so we can get an effective result in an acceptable time. Forcourse selection in the present system all work is done offline using pen paper system. This system takes more time. For attendance operation in the present system all work is done on paper. The whole session's attendance is stored in the register and at the end of the session the reports are generated. We aren't interested in generating reports in the middle of the session or as per the demand because it takes further time in computation. At the end of session, the student who doesn’t have 75 attendance gets a notice. This is a very time-consuming process. In the present system the result is viewed on the notice board. It requires a lot of paperwork and is time- consuming. Also, there is no system still

present through which scholars can take advice from elderly scholars. College cannot indeed give critical announcements to scholars in case of exigency.

2.2 Drawbacks of Existing System

1. The being system isn't user friendly because the reclamation of data is veritably slow, and data is used manually. The use of some technology can be complicated and time-consuming. These systems need to be handled by a specialist for maintaining and updating the system, which could again be veritably expensive.
2. It bear further computations to induce the report like attendance computation, chance computation. so, it is generated at the end of the session. Hence requires further time to displaythe report.
3. All computations to induce report is done manually so there's lesser chance of crimes. Then the faculty has to suffer a lot through the computation and if there's a loss of some report also it may beget a lot of problem. This is time consuming also due to exaggerating computation. Indeed, after that there are some misapprehensions which are veritably frustrating for the faculty. These computations also good the marks of the scholars which will eventually lead to their chance.
4. In this system the papers can miss placed and documents can be lost. This will beget redundant work for the admin department staff.

3.Methodology

3.1Proposed System

The system architecture has web services, a database server and the user as its factors. The window must use Wi- Fi network for internet connectivity to insure better performance. The user will login through a window. The user- type is vindicated with the database server and access is given to the applicable user. The web operation also can be used to login and perform certain operations similar as ensures that internet is on. In this module, operation generates PDF using python program. And it's also allowed to download the pdf file.

3.2 ALGORITHM

Convolutional Neural Network :-

A convolutional neural network is the preferred option when it comes to image processing or any type of prediction involving images. In a typical convolutional neural network, there are several fundamental layers that can be repeated multiple times in the network, depending on the specific subject being predicted.[10,7] The primary components consist of a convolutional layer, which employs a filter that moves across the input image. Typically, the image is larger than the filter used for sliding. The filter slides horizontally and vertically from the top of the image to the bottom, calculating the values of the convolutional layer using the dot product method. These resulting values are then passed to the subsequent layer, known as the pooling layer. This layer generally reduces the size of the values obtained from the previous layer, which represents the features extracted from the input image. This reduction is achieved by utilizing a pooling filter that slides across the previous layer's output. The convolutional and pooling layers are iterated in succession, depending on the subject being predicted, to generate the desired output. Once the features are extracted, they undergo a series of condensation and pooling layers before being flattened. The resulting output is then passed to the fully connected layer, where the prediction is made. Finally, at the output layer, the required prediction can be observed. In this particular case, the output would display the 68 key points extracted from the image[6]. The diagram below illustrates the typical structure of a CNN model.

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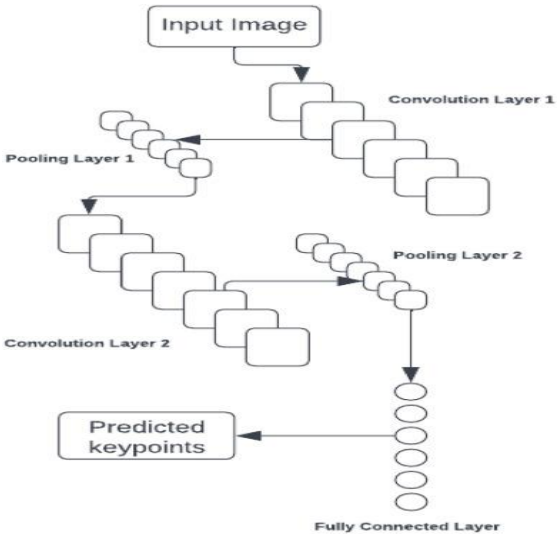
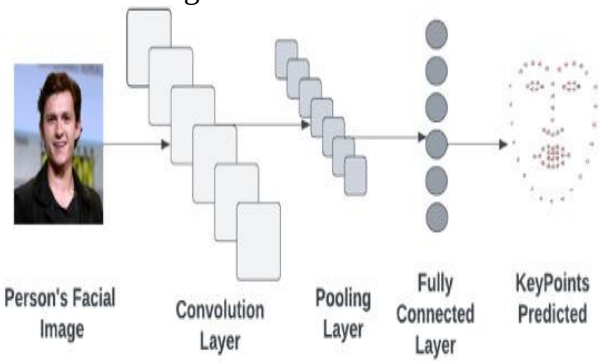


CNN architecture for Facial Keypoint Prediction:-

The proposed CNN architecture involves additional preparation steps for the image beyond the initial preprocessing stage[8]. The RGB-formatted input image is converted to grayscale, altering the color space from [0,255] to [0,1]. In order to maintain the original data consistency of 224*224 pixels, the grayscale image is resized to a standard pixel size [9]. Once these formatting adjustments are made, the image is inputted into the convolution model. The architecture of the CNN model used for keypoint extraction is illustrated in the figure below.



3.3workflow

1) Admin

• Admin Registration: - The first step in this operation is to get the HOD to register. They need to first register their information in the database. The separate person will also give his or her login id and word.

• Admin Login: - After registering the admin is allowed to log in. He or she can now view the admin homepage where there are options for Registration, Teacher's profile, notice announcementsto student. He can also view the student attendance.

• Registration: - Then, the system will validate admin to check whether admin is applicable to take the registrations of the student for any subject which he /she named from the operation after confirmation is success. And check all information related to the student.

• Teacher's profile: - Then, admin is applicable to assign the teachers and add the teachers. And check all information related to the teachers.

• student attendance: - Admin can view a report is generated which has the student's name, Rollon., student attendance. This moder these factors.

• notice announcement to student/faculty: -Admin can notice announcements to students or tutoring faculty, or some named faculty or that faculty he wants to communicate his communication to. announcements related to council meetings, seminar important information, training and placement

information.

2] Faculty/ Teaching Staff

After logging in the teachers can now view the homepage where there are options to Register-student, Test, Result, Attendance, attendance Report.

• Register-student: - Teacher can view all Register student for their subject or course. His/her can see all the information about the student.

• Test: - Teachers can leverage the system to conduct tests and promptly access results, promotinga dynamic learning environment. This can be helpful to learn capabilities of a student based on their performance and individual statistics of the same for the recommendation of further efforts to be taken by instructors and students.

• Result: - The result is generated using nltk Technique to turn their entire focus on the teaching-learning process. Also, the work aims to reduce unnecessary paperwork under these factors.

• Take Attendance: -Teaching faculty can take attendance of students during the lecture i.e. within that time frame. If he or she takes a group attendance using the group photo the attendance module uses a face detection technique to mark the attendance of student.

• Student attendance Report: - Teachers can view a report generated which has the student's name, roll no., students' attendance. This module categorized students according to their attendance. The attendance data will be stored in the collage database according to date and after every month the percentage will be generated. The generated data will be stored for future use.

• Check notifications: - Faculty can receive important announcements and information regarding meetings from the HOD or admin through these notifications.

3] Student

• View Attendance: - Students can view attendance uploaded by the faculty or admin. They can check the attendance at any time, but they cannot manipulate the data.

• View Results: - Student can indeed view results uploaded by the Teacher or faculty. They can check the marks at any time.

• View notices: - Useful information, council notices, important seminars, placement notice to the student by the teachers and Hod. They can view it anytime.

3.4 Requirement analysis

3.4.1Hardware Requirements

A. Processor: Intel Core i3 or more.
B. RAM: 4GB or more.
C. Hard disk: 250 GB or more.

.4.2Software Specification

A. Operating System: Windows 10, 7, 8.
B. Python
C. Anaconda.
D. Spyder, Jupyter notebook, Flask.
E. MYSQL.

4.Benefits of proposed system

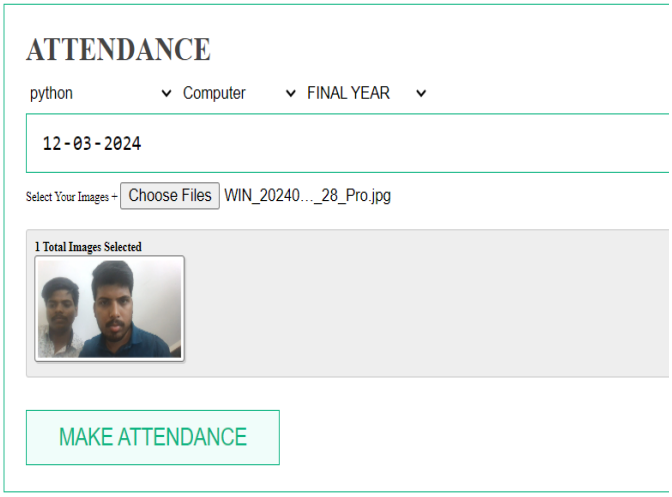
Implementing a Face Detection and Recognition Student Attendance System offers numerous advantages for both administrators and teachers. As the administrator, you have the capability to disseminate notices efficiently to both teachers and students, streamlining communication and ensuring everyone stays informed about important announcements and events. This enhances overall organizational transparency and fosters a sense of community within the educational institution. Additionally, the face detection and recognition technology automate the attendance process, reducing the administrative burden on teachers and minimizing the likelihood of errors or

discrepancies in attendance records. For teachers, the system provides a convenient platform to administer tests securely, leveraging facial recognition technology to verify student identities and maintain the integrity of the assessment process. Moreover, teachers can promptly access and analyze test results, facilitating timely feedback to students and enabling data-driven instructionaldecision-making. Overall, the implementation of this system optimizes administrative efficiency,enhances communication, and strengthens academic integrity, ultimately contributing to a more productive and effective educational environment.

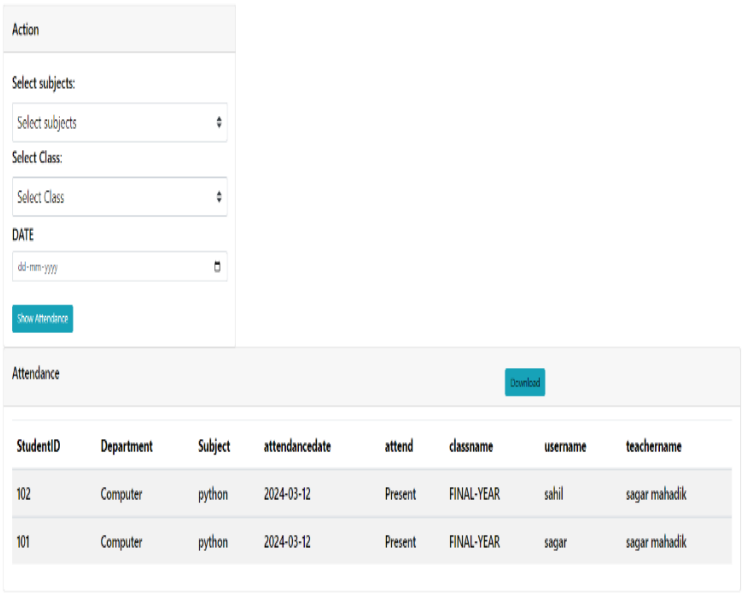
1)It is easy to use and is very simple.
2)The software will support windows.
3)will avoid confusion and resistance by catching the user's attention, as it is presentable.
4)The database should be updated with the latest values.
5)The system should display output proper.

5.Result

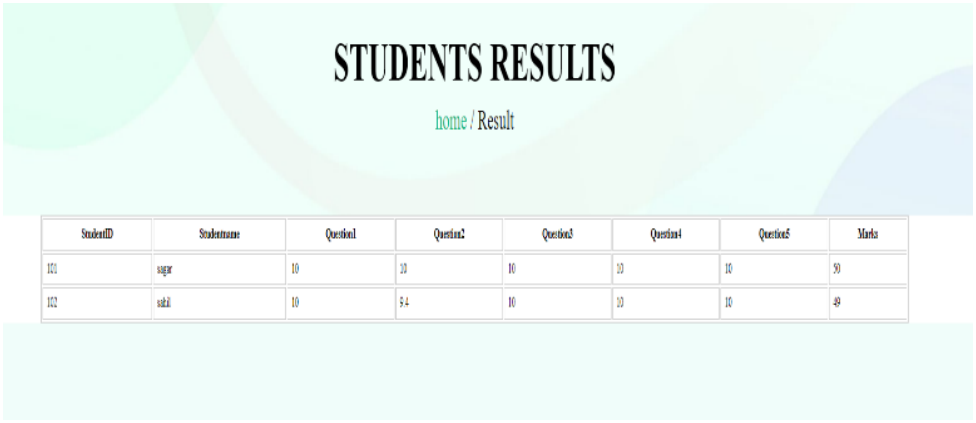
A. Marking Attendance



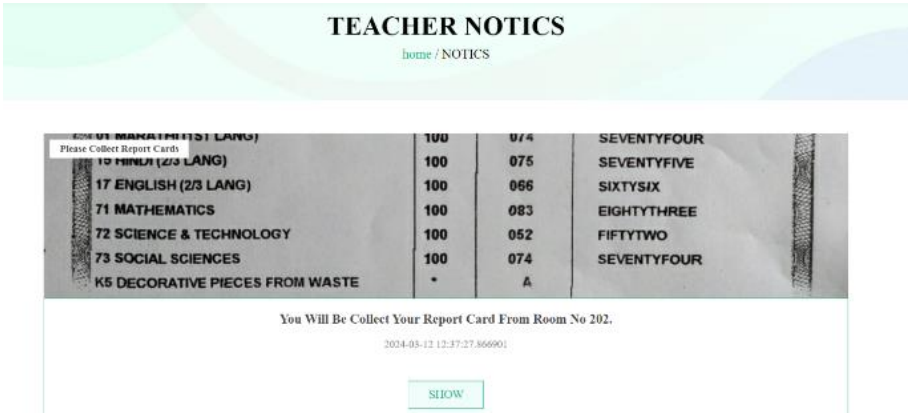
B. Attendance Result



C. Exam Result



D. Notice for Student



6. Conclusion

An innovative solution for college management, the Face Detection and Recognition Student Attendance System, has been devised to streamline administrative tasks and enhance classroom efficiency. Administrators are equipped with tools to disseminate notices efficiently to both teachers and students, ensuring seamless communication within the educational institution. Meanwhile, teachers benefit from features such as the ability to administer tests and promptly access results, facilitating a smoother teaching process. By leveraging facial recognition technology, the system ensures accurate attendance tracking, minimizing discrepancies and saving valuable instructional time. This comprehensive approach not only improves administrative workflow but also fosters a more conducive learning environment. With its emphasis on functionality, the system represents a significant step forward in modernizing student attendance management and academic operations.

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