SMART ATTENDANCE SYSTEM

Dr. S. P. Khandait, Tanaji Dhage, Akash Jadhav, Nagesh Kadam, Akash Panchal

Department of Information Technology

K.D.K College of Engineering, Nagpur

sunanda.khandait@kdkce.edu.in

tanajibdhageit22d@kdkce.edu.in

akashjadhavit22d@kdkce.edu.in

nageshvkadamit22d@kdkce.edu.in

akashnpanchalit22d@kdkce.edu.in

1. ABSTRACT

In today's society, as a first step, any organization that r elies on people must hold its employees accountable. T herefore, creating and maintaining proper management requires a lot of money from different organizations. In many countries, government agencies and schools use tr anscripts to track attendance. For example, take the tim e to call out the names of each student at the beginning of the lesson to track their attendance. Incorrect markin gs, missing names on presentations, manually entering i nformation into the system, and the possibility of a repr esentative attending are additional problems. There are some problems with this technology that has developed over time. It is important to replace these routines with r outines to track attendance. Therefore, many studies an d research have been conducted in this area using existi ng technologies. In particular, automatic identification o f specific people based on features such as QR codes, I Ds and passwords, facial recognition, fingerprint recogn ition, etc. attracts the attention of researchers. This articl e provides an overview of recent research on technolog y and intelligent systems. Our critical analysis summari zes the research literature on the technology, application areas, and key findings.

2.INTRODUCTION

In educational institutions, absenteeism is important for teachers and students. Therefore, it is important to recor d attendance. The problem arises when we always take attendance into account in the classroom. Saying studen t names or ID numbers to verify attendance is not only t ime consuming but also energy intensive. Then auto matic attendance can solve all the above problem. There are now some automatic attendance programs that man y organizations use. One of them biometrics and RFI D systems. Although it is a step forward from the autom atic and traditional process, it does not meet the time co nstraints. Students have to wait in line to attend, which t akes a lot of time. The plan outlines the process of unsi gned attendance, ensuring safety during or after the pan demic, and also the process of checking students' tempe ratures, provided that nothing disrupts the normal learni ng process and that the safety of the student, their peers, and the school or school staff is taken into account. Th e system can also be used during exams or other teachin g situations where participation is important. The syste m eliminates traditional student identifiers, such as addr essing students by their first names.or checking respective identification cards of the student, which can not only interfere with the ongoing teaching process, but also can be stressful for students during examination sessions. In addition, the students have to register in the database to be recognized. The enrolment

can be it is done on-site through a user friendly interface.

3. LITERATURE REVIEW

To recognize the representation of other objects or faces that exist in our memory. In fact, it is quite difficult to c reate a machine that has the same face recognition abilit y as a human. However, to recognize different faces, we need more memory to remember each face of a person without making mistakes. To overcome human limitatio ns, computers with unlimited memory, high performanc e and power are used in face recognition. The human fa ce is a unique expression of identity. Therefore, facial re cognition is defined as a biometric method that provides personal identification by comparing live images with i mages stored in the database of that person (Margaret R ouse, 2012). Today, facial recognition machines are pop ular due to their simplicity and performance. For examp le, airport security and the FBI use facial recognition to conduct criminal investigations by tracking suspects, mi ssing children, and organized crime (Robert Silk, 2017). In addition, the popular social networking site Faceboo k also uses facial recognition to allow users to save thei r friends in photos for fun (Sidney Fussell, 2018). Intel also allows users to use facial recognition to access thei r online accounts (Reichert, C., 2017). Apple allows use rs to unlock their iPhone X through facial recognition (d eAgonia, M., 2017). Facial recognition began in the 196 0s. The distance and ratio between the address and the r eference point were calculated and compared. In 1970, Goldstein, Harmon and Lesk strengthened the study by using other factors such as hair color. and lip thickness to automate the recognition. In 1988, Kirby and Sirovich first suggested principle component analysis (PCA) to solve face recognition problem. Many studies on face recognition were then conducted continuously until today (Ashley DuVal, 2012) The paper proposed by Zhao, W et al. (2003) has listed the difficulties of facial identification. One of the difficulties of facial identification is the identification between known and unknown images. In addition, paper proposed al. (2010) found that the training process **of** face recogn ition students is a slow and time-
consuming task. Also, the paper presented by Priyanka Wagh et al. (2015) stated that different lighting conditio ns and head poses are often issues that can cause studen ts' performances to converge based on face recognition. Gonal Marquez et al. (2019) reported that laboratories a nd teaching activities should be provided and guarantee d with reliable data. Students' comfort should be ensure d during teaching activities. Many measurements shoul d be taken and monitored reliably during laboratory stu dies, and the collected data should be stored in a stable environment as it can affect the results when the experi ment is completed and information is given. In general, product temperature should be monitored in a contact, a nd the ambient temperature should also be measured for comparison purposes. Infrared temperature sensors pro vide fast and accurate non-
contact measurements. This paper presents an Internet o f Things (IoT) solution for real-
time temperature measurement called iRT. The solution has hardware standards for temperature data collection and Web compatibility for data entry. iRT uses an infrar ed temperature sensor module with MLX90614 and pro vides real-
time and realtime temperature measurement. The web a pplication can be used to access archived data and also provide historical data on temperature changes. The obt ained results are promising and contribute to IoTbased i nfrared temperature measurement. Arun Katara et al. (2 017) highlighted the shortcomings of RFID (Radio Priv acy Identity) card technology, fingerprint technology an d iris recognition technology. RFID card system is used for convenience. However, most users can help their fri ends to verify as long as they have their ID cards. Finge rprint system works but it is ineffective as the verificati on process takes time, so users has to line up and perform the verification one by one. However for face recognition, the human face is
It is always on and contains less information than the iri s. Iris recognition systems have additional details and ca n violate the user's identity. Verbal verification is availa ble but is less accurate than other methods. Therefore, it is recommended to use facial recognition in student par ticipation, it is effective but not very useful because the verification process takes time, so the user

4. DESIGN METHODOLOGY

The objective of this project is to develop face The aim of the project is to create face recognition and t emperature measurement. The results required to compl ete the task are: Check the broken face of the photo gall ery. Extract useful features from visual faces. Classify features to identify the face. Check the body temperatur e of the detected students. ▪ Record the participation of t he identified students. Conditions: Training images wh en new faces are added to the library Adequate lighting required Continuous power supply to the Raspberry Pi (3.35V and 1.52A) Mark to participate if the competiti on face is at least 61% and the temperature is between 3 0o C and 35o C.

4.1. MODEL

We use the waterfall process. In the waterfall model, ea ch stage must be completed before the next stage can be gin, and there is no overlap between stages. The waterfa ll model is the oldest SDLC method used in software de velopment. In the waterfall method, the entire software development process is divided into several stages. The results of one stage are used as input for the next stage. This means that each stage of the development process begins only after the previous stage is complete. The wa terfall model is a design process in which progress flow s downward (like a waterfall) through ideation, release, analysis, design, build, test, production/use, production/ use.and maintenance. The waterfall model describes the software development process as a series of sequential

steps; therefore it is also called linear sequential life cyc le model.

5. IMPLEMENTATION

The main tool used in the application is open source co mputer vision (OpenCV). One of the goals of OpenCV i s to provide a simple computer vision program that help s people create visual effects quickly. The OpenCV libr ary contains more than 500 functions covering many ar eas of the visual field. The main technology behind face recognition is OpenCV. The user stands in front of the camera, maintains a distance of at least 50 cm, and uses his own image as input. The front face is extracted from the image, then converted to grayscale and saved. Appl y a principal component analysis (PCA) algorithm on th e image and store the results in an xml file. When the us er requests authentication, the front face is extracted fro m the image captured by the camera. Eigenvalues are calculated based on the measured position and comp ared with data collected from the nearest neighbor. Ope nCV: We use OpenCV 3 dependencies for Python 3. Op enCV is a library with many graphic functions. It is a gr eat photo library. You don't need to write code to get the desired results. The library is crossplatform and is freel y available under the open source BSD license. PyMLX 90614: We use this module to import functions that con nect to a noncontact infrared thermometer that can be in cluded in the code to get the temperature. Pythoncsv: W e use the CSV module to load the attendance data into t he spreadsheet in .csv format. The PiCamera strip conn ects to the camera port of the Raspberry Pi and provides the necessary connections to use the MLX90614 infrar ed non-contact temperature sensor.

6. CONCLUSION

Capturing images from video cameras or CC cameras a nd using face detection and recognition technology can reduce the user's manual work and increase security, an d the decision can be based on acceptance. Based on thi s, face detection and recognition can be used for many a pplications such as automatic attendance based on face recognition, staff attendance, security, safety and law en forcement (such as finding thieves in pictures and helpi ng to catch thieves). In this system**,** we **used** attendance for lectures, sections or laboratories where a teacher or t eaching assistant can record students' attendance. It sav es time and effort, especially if you have a large number of students. This attendance introduces the use of face r ecognition technology for student attendance and furthe r studies; this student information can be used for examr elated questions. Temperature measurement with an infr ared thermometer is an electronic device consisting of a lens that focuses infrared (IR) energy onto an electroni c sensor, converting the energy into an electrical signal t hat can be measured at room temperature after compens ating for the environment. . signal change. From the beg inning to the end of the installation of this system, the f ollowing results have been achieved. These are: ▪ The s ystem can be managed by people who are not IT person nel. ▪ The system is intended for commercial use. ▪ The system can recognize thousands of faces. Ø This system can serve as many people as possible in the organizatio n.

6.1. LIMITATIONS

If the bearded person removes the beard or vice versa it will not be recognized. Also if the face gets highly injured it will not get recognized.

6.2. FUTURE SCOPE

the future this project can be improved from time to ti me using: Security can be improved. Ø Neural networks can be used to achieve accuracy. ☆ Can be used for lar ge factories or participating workers. Ø Can be created f rom a complete website. -
Ability to create an easy to use user interface -
can combine multiple participation forms to include all student participation

7. REFERENCES

[1] A. Rahman, K. Sultan, N. Aldhafferi, A. Alqahtani, M. Mahmud, “Reversible and Fragile Watermarking for Medical
Images”, Computational and Mathematical Methods in Medicine, June 2018.
[2] A. Rahman, K. Sultan, Naheir Aldhafferi, A. Alqahtani, D.
Abdullah, M. Mahmud, “Robust and Fragile Watermarking
for Medical Images: A Joint Venture of Coding and Chaos
Theories”, Journal of Healthcare Engineering, June 2018.
[3] A. Rahman, S.A. Alrashed, A. Abraham, “User Behavior
Classification and Prediction using FRBS and Linear
Regression” Journal of Information Assurance and Security,
vol. 12, no. 3, pp. 86-93, 2017.
[4] A. Rahman, M. Ahmed, G. Zaman, T. Iqbal, M.A.A Khan et
al., “Geo-Spatial Disease Clustering for Public Health
Decision Making,” Informatica, vol. 46, no. 6, pp. 21-32,
2022.
[5] S. Arooj, A. Rahman, M. Zubair, M.F. Khan, K. Alissa, M.A.
Khan and A. Mousavi, “Breast Cancer Detection