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Face Recognition Based Attendance System

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ABSTRACT: In this digital era, face recognition system plays a vital role in almost every sector. Face recognition is one of the mostly used biometrics. It can used for security, authentication, identification, and has got many more advantages. Despite of having low accuracy when compared to iris recognition and fingerprint recognition, it is being widely used due to its contactless and non-invasive process. Furthermore, face recognition system can also be used for attendance marking in schools, colleges, offices, etc. This system aims to build a class attendance system which uses the concept of face recognition as existing manual attendance system is time consuming and cumbersome to maintain. And there may be chances of proxy attendance. Thus, the need for this system increases. This system consists of four phases- database creation, face detection, face recognition, attendance updation. Database is created by the images of the students in class. Face detection and recognition is performed using Haar-Cascade classifier and Local Binary Pattern Histogram algorithm respectively. Faces are detected and recognized from live streaming video of the classroom. Attendance will be mailed to the respective faculty at the end of the session.

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KEYWORDS: Face Recognition; Face Detection; Haar-Cascade classifier; Local Binary Pattern Histogram; attendance system

I. INTRODUCTION

Every organization requires a robust and stable system to record the attendance of their students. and every organization have their own method to do so, some are taking attendance manually with a sheet of paper by calling their names during lecture hours and some have adopted biometrics system such as fingerprint, RFID card reader, Iris system to mark the attendance. The conventional method of calling the names of students manually is time consuming event. The RFID card system, each student assigns a card with their corresponding identity but there is chance of card loss or unauthorized person may misuse the card for fake attendance. While in other biometrics such as finger print, iris or voice recognition, they all have their own flaws and also they are not 100% accurate.

Use of face recognition for the purpose of attendance marking is the smart way of attendance management system. Face recognition is more accurate and faster technique among other techniques and reduces chance of proxy attendance. Face recognition provide passive identification that is a person which is to be identified does not to need to take any action for its identity. Face recognition involves two steps, first step involves the detection of faces and second step consist of identification of those detected face images with the existing database. There are number of face detection and recognition methods introduced. Face recognition works either in form of appearance based which covers the features of whole face or feature based which covers the geometric feature like eyes, nose, eye brows, and cheeks to recognize the face.

Our system uses face recognition approach to reduce the flaws of existing system with the help of machine learning, it requires a good quality camera to capture the images of students, the detection process is done by histogram of oriented gradient. And recognizing perform through deep learning. The frontend side (client side) which consist of GUI which is based on electron JS and backend side consist of logic and python (server side), an IPC (Inter Personal Communication) bridge is developed to communicate these two stacks. The images capture by the camera is sent to system for further analysis, the input image is then compared with a set of reference images of each of the student and mark their attendance.

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II. LITERATURE SURVEY

Authors in [3] proposed a model of an automatedattendance system. The model focuses on how face recognition incorporated with Radio Frequency Identification (RFID) detect the authorized students and counts as they getin and get out form the classroom. The system keeps the authentic record of every registered student. The system also keeps the data of every student registered for a particular course in the attendance log and provides necessary information according to the need. In this paper [4], authors have designed and implemented an attendance system which uses iris biometrics. Initially, the attendees were asked to register their details along with their unique iris template. At the time of attendance, the system automatically took class attendance by capturing the eye image of each attendee, recognizing their iris, and searching for a match in the created database. The prototype was web based.

III. EXISTING SYSTEM

Traditional method of attendance marking is a tedious taking many schools andcolleges. It is also an extra burden to the faculties who should mark attendance by manually calling the names of students which might take about 5 minutes of entire session. This is time consuming. There are some chances of proxy attendance. Therefore, many institutes started deploying many other techniques for recording attendance like use of Radio FrequencyIdentification (RFID), iris recognition, fingerprint recognition, and so on. However, these systems are queue based which might consume more time and are intrusive in nature.

Disadvantages of existing system

- Huge storage requirements, vulnerable detection, ad potential privacy issues.
- Time consuming level are huge.
- Security level is low.
- Complexity for managing data.
- Problem occurs while searching require data.

IV. PROPOSED SYSTEM

Compared to existing system traditional attendance making system this system reducesthe workload of a people. The present system of attendance marking i.e., manually callingout the roll call by the faculty have quite satisfactorily served the purpose. With the changein the educational system with the introduction of new technologies in classroom such as virtual classroom, the traditional way of taking attendance may not be viable anymore. Even with rising number of course of study offered by universities, processing of attendance manually could be time consuming. Hence, in our project we aim at creating a system to take attendance using facial recognition technology in classrooms and creating an efficient database to record them. Facial recognition is a technology that can benefit society, including increasing safety and security, preventing crimes, and reducing human interaction.

Advantages of proposed system:-

Nowadays there are many advantages of face recognition systems such as their convenience and social acceptability.

- Helps find missing students.
- Reduces the number of touch points, Improves photo organization.
- Face recognition is easy to use and, it can performed without person even knowing. Thecamera price should go down.
- This system is convenient, Face recognition is more user-friendly.
- Can help users to improve our overall safety levels. It is in inexpensive techniques of identification.
- Machine learning will help to improve and expand facial recognition.

V. SYSTEM OVERVIEW - MODEL IMPLEMENTATION

- **USER INTERFACE DESIGN -** Face Recognition based Attendance System is simple and works efficiency. The system works automatically once the registration of individual student created by the administration. This is front page of our attendance system. Which is based on HTML5, CSS3& JS. It consist of the following modules ,

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- ✓ **Student Registration**
- ✓ **Face Recognition**

The users can interact with the system using a GUI that was developed by HTML. Here users will be mainly provided with two different options such as, student registration, and take attendance. In student registration, the student details have been stored, the take attendance module design will starts the webcam and take the live video and compares with the existing database for marking attendance.

- **USER REGISTERATION** - All the students of the class must register themselves by entering the required details like name and roll number and then their images will be captured and stored in the dataset. The students are supposed to enter all the required details in the student registration form. After clicking on register button, the web cam starts automatically and window pops up and starts detecting the faces in the frame. Then it automatically starts clicking photos until 50 samples are collected. These images then will be pre-processed and stored in **training images folder.**

- **DATASET CREATION** -Images of students are captured using a web cam. Multiple images of single student will be acquired with varied gestures and angles. These images undergo pre-processing. The images are cropped to obtain the Region of Interest (ROI) which will be further used in recognition process. Next step is to resize the cropped images to particular pixel position. Then these images will be converted from RGB to gray scale images. And then these images will be saved as the names of respective student in a folder.

- **FACEDETECTION** - Face detection here is performed using Haar-Cascade Classifier with OpenCV. Haar Cascade algorithm needs to be trained to detect human faces before it can be used for face detection. This is called feature extraction. The haar cascade training data used is an xml file haarcascade_frontalface_default. The haar xml file will be used for feature extraction.

- **FACE RECOGNITION** - In recognition process the data of the user which is present in the data base is compared with the person data who is in front of the camera both data is compared by local binary patter histograms of two data if it matches then the person is recognised and go to further process. Else it displays unknow ID.

OUTPUT IN MS EXCEL

We get the output as given Attendance.csv file. After that we can derive the results in appropriate format using different function in the spreadsheet. We can get the following parameters by using this format as output as shown in folder name “Attendance with date”. This function is performed using the Spreadsheet Link Ex toolbox of the PYTHON. If a person is present, name-id ‘1’ is passed on to the particular field of the student , The date and time are also passed on to the sheet. We can include any number of students’ data using this system and provided we use a better quality of an image capturing device. Appropriate format using different function in the spreadsheet. We can get the following parameters by using this format as output as shown in folder name “Attendance with date”. This function is performed using the Spreadsheet Link Ex toolbox of the PYTHON. If a person is present, name-id ‘1’ is passed on to the particular field of the student , The date and time are also passed on to the sheet. We can include any number of students’ data using this system and provided we use a better quality of an image capturing device.

VI. SYSTEM IMPLEMENTATION

HTML

- The part of a website that the user interacts directly is termed as front end.
- It is also referred to as the “client side” of the application.
- Front end development consists of several contents,
    1. **HTML**
    2. **CSS**
    3. **Bootstrap**
    4. **Java Script**
- HTML stands for Hyper Text Mark-up Language.
- It is used to design the front end portion of web pages using mark-up language.
- It acts as a skeleton for a website since it is used to make the structure of a website.
- HTML is used to create the structure of web pages that are displayed on the World WideWeb (www).

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- It contains Tags and Attributes that are used to design the web pages. Also, we can linkmultiple pages using Hyperlinks.

CSS

- Cascading Style Sheets.
- Fondly referred to CSS is simple designed language intended to simplify the process ofmaking web pages presentable.
- It is used to style our website.

Three types of CSS which are given below:

- **Inline:** Inline CSS contains the CSS property in the body section attached with theelement known as inline CSS.
- **Internal or Embedded:** The CSS rule set should be within the HTML file in the headsection i.e. the CSS is embedded within the HTML file.
- **External:** External CSS contains a separate CSS file that contains only style propertywith the help of tag attributes.

BOOTSTRAP - Bootstrap is a free and open-source tool collection for creating responsive websites and web applications. It is the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first websites.

JAVASCRIPT

- JavaScript is an object-based scripting language which is lightweight and cross-platform. JavaScript is not a compiled language, but it is a translated language.
- The JavaScript Translator (embedded in the browser) is responsible for translating theJavaScript code for the web browser.
- Features of JavaScript
- All popular web browsers support JavaScript as they provide built-in executionenvironments.
- JavaScript is an object-oriented programming language that uses prototypes rather than using classes for inheritance.

MACHINE LEARNING - Machine Learning is growing technology which enables computers to learn automaticallyfrom past data. Machine learning uses various algorithms for building mathematical models and making predictions using historical data or information. Currently, it is being used for various tasks such as image recognition, speech recognition, email filtering, Face book auto- tagging, recommender system, and many more. Machine also learn from experiences or past data like a human does so here comes the role of Machine Learning.

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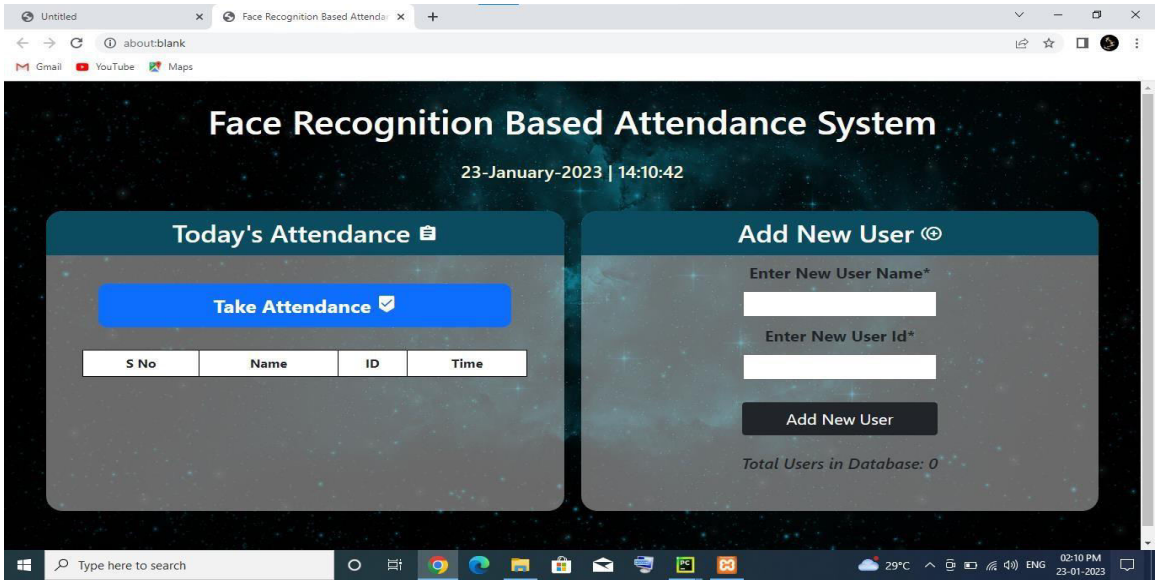

Fig: 6.1 Login Page

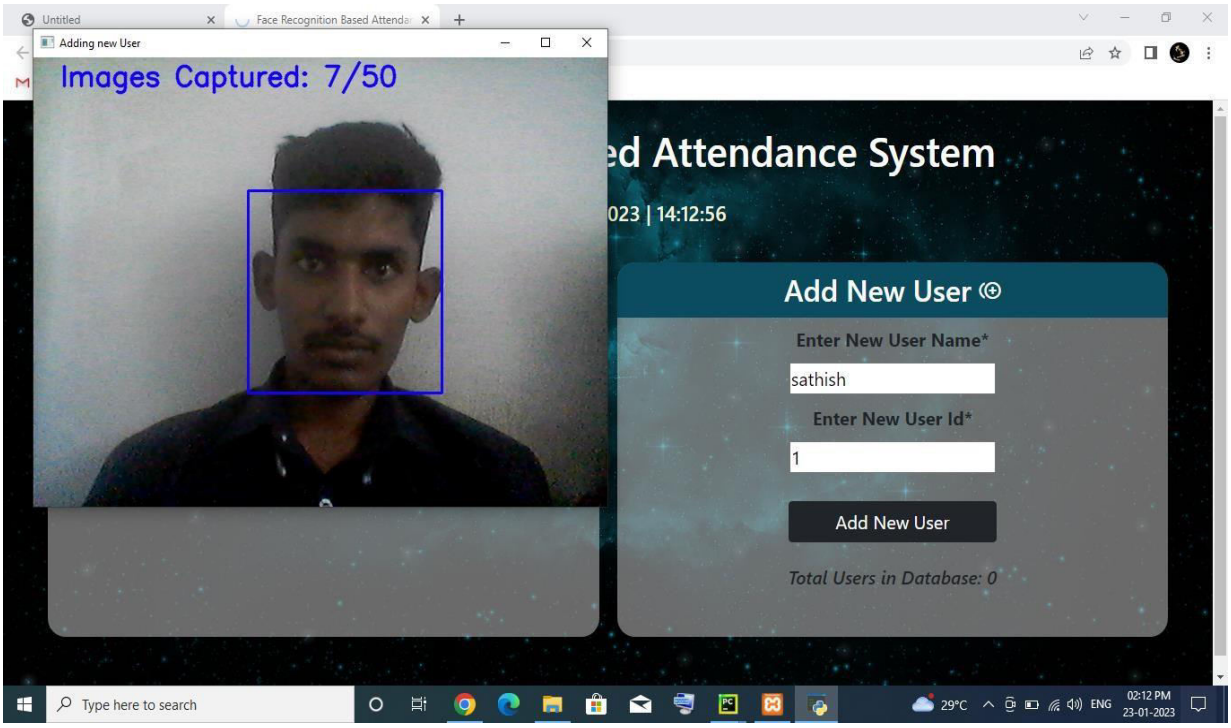

Fig: 6.2 Images Captured System

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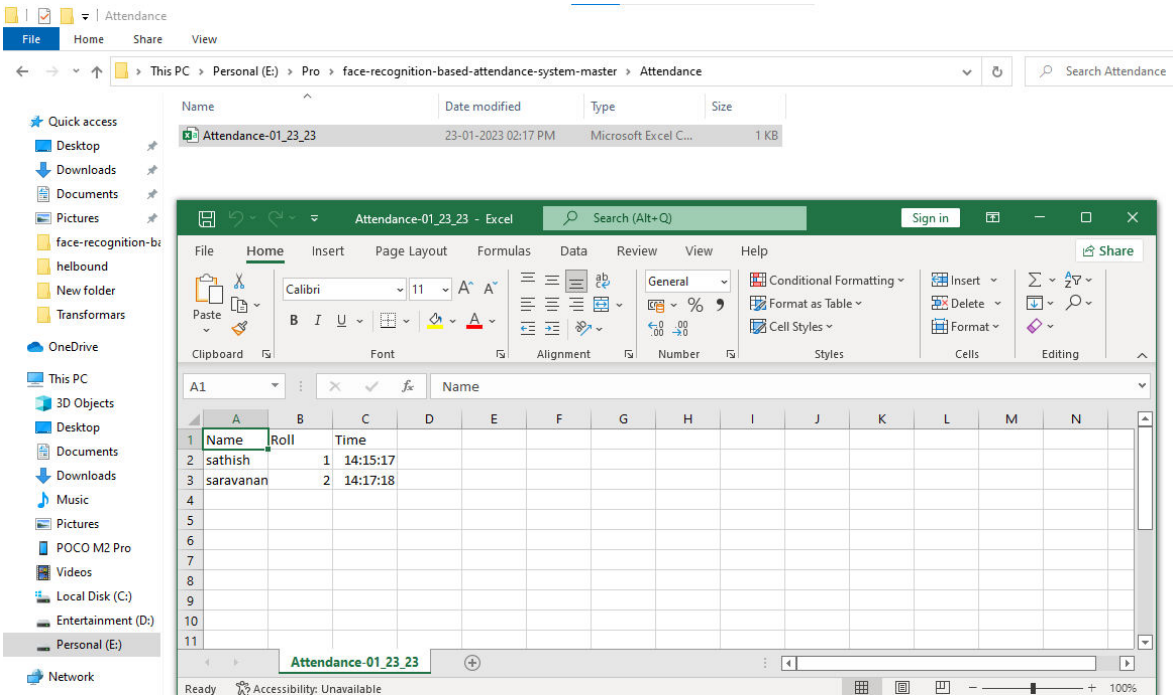

Fig: 6.3 Attendance Reportage in Excel Sheet Deliver System

VII. FUTURE ENHANCEMENT

The system can be made more flexible and scalable using these recommendations. Pleasenote that the system implemented here is just a prototype of idea presented via this project.

The recommendations are as follows:

- The field of facial recognition technology is rapidly evolving, and there are several areas in which future improvements are likely to occur:
- Increased accuracy: Future advancements in facial recognition technology are likely to lead to increased accuracy and reduced error rates, particularly in difficult recognition scenarios such as recognizing individuals in low-light conditions or withglasses.
- Improved speed: With the increasing demand for real-time facial recognition, futureimprovements are likely to focus on reducing the time it takes for the system to process and recognize a face.
- Increased diversity: As facial recognition technology becomes more widespread, there is a growing need to ensure that it works equally well for all individuals, regardless of their race, ethnicity, or gender. Future improvements are likely to focus on increasing the diversity of the systems and making them more inclusive. Better privacy protection: As concerns about privacy and data protection continue to grow, future improvements in facial recognition technology are likely to focus on better protecting individual's data and privacy rights.
- More secure systems: With the increasing use of facial recognition technology, there is a growing need to ensure that the systems are secure and resistant to hacking and other forms of cyberattacks.
- Integration with other technologies: Future advancements in facial recognition technology are likely to be closely tied to the development of other related technologies, such as artificial intelligence and the Internet of Things, leading to the integration of facial recognition with other technologies for a more seamless user experience.
- These are some of the areas in which future improvements in facial recognition technology are likely to occur, and it is exciting to see what developments will comein the future.

VIII. CONCLUSION

This system aims to build an effective class attendance system using facrecognition techniques. The proposed system will be able to mark the attendance via face Id. It will detect faces via webcam and then recognize the faces. After

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recognition, it will mark the attendance of the recognized student and update the attendance record.

REFERENCES

1. R.Karthikeyan, & et all ”Biometric for Mobile Security” in the international journal of Engineering Science & Computing, Volume7,Issue6, June 2017, ISSN(0):2361-3361,PP No.:13552-13555.
2. R.Karthikeyan, & et all ”Data Mining on Parallel Database Systems” in the international journal of Engineering Science & Computing, Volume7,Issue7, July 2017, ISSN(0):2361-3361,PP No.:13922-13927.
3. R.Karthikeyan, & et all ”Ant Colony System for Graph Coloring Problem” in the international journal of Engineering Science & Computing, Volume7,Issue7, July 2017, ISSN(0):2361-3361,PP No.:14120-14125.
4. R.Karthikeyan, & et all ”Classification of Peer –To- Peer Architectures and Applications” in the international journal of Engineering Science & Computing, Volume7,Issue8, Aug 2017, ISSN(0):2361-3361,PP No.:14394-14397.
5. R.Karthikeyan, & et all ”Mobile Banking Services” in the international journal of Engineering Science & Computing, Volume7,Issue7, July 2017, ISSN(0):2361-3361,PP No.:14357-14361.
6. R.Karthikeyan, & et all ”Neural Networks for Shortest Path Computation and Routing in Computer Networks” in the international journal of Engineering and Techniques, Volume 3 Issue 4, Aug 2017, ISSN:2395-1303,PP No.:86-91.
7. R.Karthikeyan, & et all ”An Sight into Virtual Techniques Private Networks & IP Tunneling” in the international journal of Engineering and Techniques, Volume 3 Issue 4, Aug 2017, ISSN:2395-1303,PP No.:129-133.
8. R.Karthikeyan, & et all “Routing Approaches in Mobile Ad-hoc Networks” in the International Journal of Research in Engineering Technology, Volume 2 Issue 5, Aug 2017, ISSN:2455-1341, Pg No.:1-7.
9. R.Karthikeyan, & et all “Big data Analytics Using Support Vector Machine Algorithm” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 6 Issue 9, Aug 2018, ISSN:2320 - 9798, Pg No.:7589 -7594.
10. R.Karthikeyan, & et all “Data Security of Network Communication Using Distributed Firewall in WSN ” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 6 Issue 7, July 2018, ISSN:2320 - 9798, Pg No.:6733 - 6737.
11. R.Karthikeyan, & et all “An Internet of Things Using Automation Detection with Wireless Sensor Network” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 6 Issue 9, September 2018, ISSN:2320 - 9798, Pg No.:7595 - 7599.
12. R.Karthikeyan, & et all “Entrepreneurship and Modernization Mechanism in Internet of Things” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 7 Issue 2, Feb 2019, ISSN:2320 - 9798, Pg No.:887 - 892.
13. R.Karthikeyan & et all “Efficient Methodology and Applications of Dynamic Heterogeneous Grid Computing” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 7 Issue 2, Feb 2019, ISSN:2320 - 9798, Pg No.:1125 -1128.
14. R.Karthikeyan & et all“Entrepreneurship and Modernization Mechanism in Internet of Things” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 7 Issue 2, Feb 2019, ISSN:2320 - 9798, Pg No.:887– 892.
15. R.Karthikeyan & etall“Efficient Methodology for Emerging and Trending of Big Data Based Applications” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 7 Issue 2, Feb 2019, ISSN:2320 - 9798, Pg No.:1246– 1249.
16. R.Karthikeyan & et all “Importance of Green Computing In Digital World” in the International Journal of Innovative Research in Computer and Communication Engineering, Volume 8 Issue 2, Feb 2020, ISSN:2320 - 9798, Pg No.:14 – 19.
17. R.Karthikeyan & et all “Fifth Generation Wireless Technology” in the International Journal of Engineering and Technology, Volume 6 Issue 2, Feb 2020, ISSN:2395–1303.
18. R.Karthikeyan & et all “Incorporation of Edge Computing through Cloud Computing Technology” in the International Research l Journal of Engineering and Technology, Volume 7 Issue 9, Sep 2020 ,p. ISSN:2395–0056, e. ISSN:2395–0072.
19. R.Karthikeyan & et all “Zigbee Based Technology Appliance In Wireless Network” in the International Journal of Advance Research and Innovative Ideas in Education, e.ISSN:2395 - 4396, Volume:6 Issue: 5 , Sep. 2020. Pg.No: 453 – 458, Paper Id:12695.

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| DOI: 10.15680/IJIRCCE.2023.1106051 |

20. R.Karthikeyan & et all "Automatic Electric Metering System Using GSM" in the International Journal of Innovative Research in Management, Engineering and Technology, ISSN: 2456 - 0448, Volume:6 Issue: 3 , Mar. 2021. Pg.No: 07 – 13.
21. R.Karthikeyan & et all "Enhanced the Digital Divide Sensors on 5D Digitization" in the International Journal of Innovative Research in Computer and Communication Engineering, e-ISSN: 2320 – 9801, p-ISSN: 2320 - 9798, Volume:9 Issue: 4 , Apr. 2021. Pg.No: 1976 – 1981.
22. R.Karthikeyan & et all "Comparative Study Of Latest Technologies In Surface Computing" in the International Journal Of Advance Research And Innovative Ideas In Education, ISSN: 2395-439, Volume:7 Issue: 2 , Apr. 2021. Pg.No: 1540 – 1545.
23. R.Karthikeyan & et all "Crop Yield Prediction Based On Indian Agriculture Using Machine Learning" in the International Journal Of Engineering and Techniques, ISSN: 2395-1303, Volume:8 Issue: 4 , July. 2022. Pg.No: 11 – 22.
24. R.Karthikeyan & et all "A Blockchain Approach to Ensuring Provenance to Outsourced Cloud Data in A Sharing Ecosystem" in the International Journal Of Multidisciplinary Research In Science, Engineering and Technology, ISSN: 2584-7219, Volume: 5 Issue: 7, July. 2022. Pg.No: 1740 – 1744.
25. R.Karthikeyan & et all "College Bus Transport Management Web Application" in the International Journal Of Multidisciplinary Research In Science, Engineering and Technology, ISSN: 2582-7219, Volume: 6 Issue: 6, June. 2023. Pg.No: 1619 – 1625.

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