# ABSTRACT

In Universities, collages and schools attendance is one of the major important task and key role that must be done on a daily basis everyday. The attendance system is used to track the student whether they are attending the classes or not. There are many different types of attendance monitoring systems such as Radio-frequency Identification system, Biometric based systems, paper-based attendance system and Facial-recognition systems etc. Traditional methodology for taking attendance is by calling students name or roll number and then the attendance is recorded in the sheet. The traditional methodology has a lot of ambiguity that caused inaccurate and inefficient of attendance taking. For each lecture its wastage of time and few students may miss there attendance. Its very difficult to cross-verify the students attendance and it consumes more time to avoid the looses, in this paper we propose a system called “ATTENDANCE MANAGEMENT SYSTEM BASED ON FACE RECOGNITION” it is more secure and time saving process. The process, which is based on face detection and recognition by using Convolutional Neural Network(CNN) algorithm, automatically detects the student face when the student enters the class room and marks the attendance by recognizing the particular student by extracting the image. The system will record and store the attendance of the student in class room environment automatically in the database. The student database includes the student name, roll numbers and their images. When a student is identified, the attendance will be taken down automatically saving necessary information into a excel sheet from database. At the end of the day, the excel sheet containing attendance information will be sent to the respective faculty and student. The design and algorithms used in this paper in each stages are described.

***Keywords -*** *Radio-frequency, face recognition, face detection, Convolutional Neural Network(CNN).*

# List of Figures

|  |  |  |
| --- | --- | --- |
| **Fig No** | **Name of the Figure** | **Page No** |
| Figure 1.1 | CNN Architecture | 2 |
| Figure 1.2 | Convo Layers | 4 |
| Figure 1.3 | Types of Haar Features | 4 |
| Figure 1.4 | Types of Haar Features | 5 |
| Figure 1.5 | Internal Images | 5 |
| Figure 1.6 | Adaboost Training | 6 |
| Figure 1.7 | Implementing Cascading classifiers. | 7 |
| Figure 3.2.1 | Functional diagram of attendance management system | 25 |
| Figure 3.2.2 | An Overview of the complete working process | 26 |
| Figure 3.3.1 | Downsampling | 27 |
| Figure 3.3.2 | RGB representation of a image | 28 |
| Figure 3.3.3 | Convolutional operation | 29 |
| Figure 3.3.4 | Visualization of Convolutional | 29 |
| Figure 3.3.5 | Convolutional with Stride 1 | 30 |
| Figure 3.3.6 | Stride 1 with padding 1 | 30 |
| Figure 3.3.7 | After applying padding | 31 |
| Figure 3.3.8 | Different layers of CNN | 32 |
| Figure 3.3.9 | CS231 n Convolutional Neural Networks | 33 |
| Figure 3.3.10  Figure 3.3.11 | Model Visualization  A general representation of training a Haar Classifier | 34  35 |
| Figure 3.3.12 | Types of Haar features | 36 |
| Figure 3.3.13 | Illustration for how an internal image works | 36 |
| Figure 3.3.14 | Representation of a boosting algorithm | 37 |
| Figure 3.3.15 | A flowchart of cascade classifiers | 38 |
| Figure 4.1.1 | Raspberry Pi B+ model | 39 |
| Figure 4.1.2 | Raspberry Pi hardware Connections | 42 |
| Figure 4.1.3 | Raspberry Pi 3B+ model Camera Module | 46 |
| Figure 4.1.4 | Camera details of Raspberry Pi 3B+ | 47 |
| Figure 4.1.5 | Connection kit of Raspberry Pi’s Camera Serial Interface | 47 |
| Figure 4.1.6  Figure 4.1.7  Figure 4.1.8  Figure 4.2.1  Figure 4.2.2  Figure 4.2.3  Figure 4.2.4  Figure 4.2.5  Figure 4.2.6  Figure 4.2.7  Figure 5.1  Figure 5.2  Figure 5.3  Figure 5.4 | Select the “Camera” option and press “Enter”  Select “Enable” and press “Enter”  Select “Yes” and press “Enter”. Your Pi will reboot  Google Fire Base  Categories in which firebase provides its services  Realtime Database of Firebase  Cloud firestore(NoSQL document database)  Firebase Authentication service  Remote configuration service  Firebase Cloud Messaging  Collection of data of n number of students  Captured image through pi 3b camera module  Processing time of multiple user inputs  Student login Credentials | 48  49  50  51  52  52  53  53  54  55  56  57  57  58 |

**List of Tables**

|  |  |  |
| --- | --- | --- |
| **Table No** | **Name of Table** | **Page No** |
| Table 4.1 | Comparative analysis table of Raspberry pi | 41 |
| Table 5.1 | Output data of students that are marked present | 58 |