MES COLLEGE OF ENGINEERING, KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA246 – MAIN PROJECT

PRO FORMA FOR THE APPROVAL OF THE FOURTH SEMESTER MAIN PROJECT

*(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information.   Incomplete Pro forma of approval in any respect will be rejected.)*

| | |
|---|---|
| Main Project Proposal No  : _____1_____<br>*(Filled by the Department)* | Academic Year         : 2021- 22<br><br>Year of Admission    : 2020 |

1.  Title of the Project          :  Random Interval Attendance Management System for Post-Covid

  Virtual Learning (RIAMS)

2.  Name of the Guide        : Mr. Nowshad C V

3.  Student Details  (in BLOCK LETTERS)

| Name | Register Number | Signature |
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| SAREENA | MES20MCA-2045 | |

Date:  16/04/2022

**Approval Status :**    Approved / Not Approved

Signature of
Committee Members

**Comments of the Guide**                                                          Dated Signature

Initial Submission      :

  _____

First Review              :

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Second Review          :

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**Comments of the Project Coordinator**                                  Dated Signature

Initial Submission:

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First Review

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Second Review

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Final Comments :

  Dated Signature of HOD

# RANDOM INTERVAL ATTENDANCE MANAGEMENT SYSTEM FOR POST-COVID VIRTUAL LEARNING (RIAMS)

Sareena

**Introduction:** The COVID-19 pandemic outbreak has resulted in an enormous demand for innovative technologies to significant issues that have emerged while substituting face-to-face learning with online virtual learning. Owing to the mandatory social distancing compelled by the pandemic, the standard operating mode of educational institutions around the world has changed into virtual mode. The closure of educational institutions compelled the teachers to use online platforms. The virtual classrooms created by online meeting platforms are the only alternative for face-to-face interaction in physical classrooms. Subsequently, virtual classrooms are created using online meeting platforms like Zoom, Google Meet, Microsoft Teams, and Cisco Webex Meetings. Educational institutions, teachers, and students are finding more advantages this new experience that were not popular before. But students' attendance management in virtual classes is a major challenge faced by the teachers. Student attendance has a direct relationship with their active learning which is the measure of their engagement in their course. Attendance is a mandatory prerequisite by various universities for the students to take their final examinations in every course. However, during virtual learning, it is more challenging to keep track of the attendance of students. Calling names of the students to take attendance is both trivial and time-consuming in virtual classroom. There is a possibility that students may resort to unethical activities like not attending the class but still keeping their status as 'online'. In this case, teachers may not be able to check whether the student is actually present and paying attention to the class, as the student might have turned off the video camera. Thus, it became an immediate necessity to develop a proper tracking system to monitor students' attendance and engagement during this time. Here we are introducing a novel approach in order to realize a highly efficient and robust attendance management system for virtual learning. We introduce the Random Interval Attendance Management System.

**Objectives:** The key objective of Random Interval Attendance Management System (RIAMS) is to develop a robust system that can monitor students' attendance and engagement in a virtual classroom, at a time of random intervals. It is a novel design using the AI Deep CNN (Convolution Neural Network) model to capture face biometric randomly from students' video stream and record their attendance automatically. Thus, the main component of the proposed model is a face recognition module built using the AI-DL tools. RIAMS also incorporates ancillary submodules for assessing students' responses to CAPTCHAs and UIN queries, to ensure active engagement in virtual classrooms. The proposed method is the simplest and the best approach to automatically capture the attendance during virtual learning. It precisely monitor attendance in virtual classrooms without affecting the students' focus on learning. Also it can generate attendance reports, pinpointing students' attention during virtual learning at random time intervals. Moreover, its novel random attendance tracking approach can also prevent the dropping out of participants from the virtual classroom and its randomness ensures that students cannot predict at which instant of time the attendance is registered. It requires only nominal internet bandwidth in comparison with the existing face recognition based attendance tracking systems, which is an advantage of this system. Existing face recognition systems require students' video cameras to be kept 'ON'

throughout the virtual classroom session while the proposed model can be easily scaled and integrated into a wide variety of virtual meetings, including business meetings. Neither the students nor the teachers will have to face any difficulties during the online session while using this RIAMS design. As the random intervals required for the execution of this model are too short (30 seconds, or less), the teaching-learning process is not affected. For instance, the students need to switch on their cameras for less than a minute only. Similarly, the CAPTCHA and UIN queries are also fast processes which also take less than 30 seconds.

**Problem Definition**: Random Interval Attendance Management System (RIAMS) is an innovation based on Artificial Intelligence - Deep Learning. It is designed to help the teachers across the globe for effective attendance management during virtual learning. It facilitates precise and automatic tracking of students' attendance in virtual classrooms. It contains a customized face recognition module along with specially designed ancillary submodules. Both the face recognition and the sub modalities are for students' attendance monitoring. The submodules check students' responses to CAPTCHAs and UIN queries. At random time intervals, the system captures face biometric from the video stream of participants and collects the timely responses of students to CAPTCHAs and UIN queries. An intelligible and adaptive weighting strategy is employed for finalizing the decisions from the three modalities. Through an application interface like a web page or a specific App this system could be integrated with any existing virtual meeting platform.
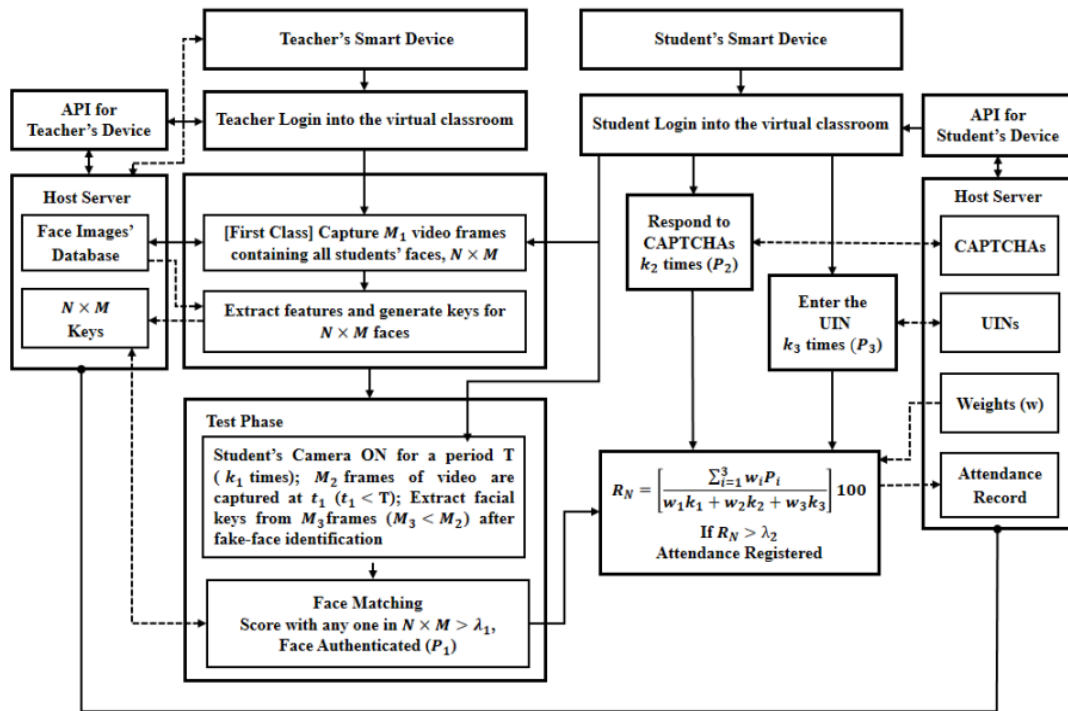
Design Architecture of RIAMS

**Basic functionalities:** The faculty and students should log in to the online learning platform with their smart devices. The web interface page should remain active during the entire course of the class. Here, the web interface at the teachers' smart device facilitates two things.
1) It provides the teacher with a timely reminder to click the web-screen for capturing all students' faces of the virtual class for initiating the attendance entry.
 2) It performs the extraction of face images from the web screen.

This system allows teachers to precisely monitor and manage students' attendance and generate reports as per the administrative requirements. The automated system reduces wastage of time and manual labour involved in tracking and managing attendance in virtual classrooms. RIAMS is very user-friendly and robust and can be easily integrated with any existing virtual meeting platform. It offers the following innovative and efficient features. 1) The proposed design has a robust and efficient AI-DL based face recognition module, customized for virtual learning applications with an added fake-face identification subsystem that monitors only genuine faces in the virtual classroom.

Software Requirements:

Web Application:-
 • IDE - NetBeans
 • Frontend – JSP
 • Backend – MySQL
 • OS- Windows/Linux

Mobile Application:-
IDE-Android Studio
Frontend- xml
Backend-java
OS – Android

Hardware Requirements:

Processor- Core i3 or above
Hard disk – 500 GB
Memory – 4GB RAM
Mobile- Android Phone with version KitKat or higher