Title of the Project:

Design of an Attendance System for Large Classrooms

Abstract

- **Motivation & Existing Systems**

Manual registration of attendance in classrooms is both time consuming and cumbersome, resulting in waste of considerable amount of time for students and teachers. Academically, it is evident that lower attendance percentages reduce the cognitive and interactive understanding abilities of students. This brings about a need for a faster and more efficient method of attendance monitoring system, which is the basic purpose of this project.

Attendance in IITs is proving to be an important determining factor in the academic performance of students. Thus, with declining number of students attending classes, their performances dwindle, resulting in subsequent frustration and depression. With the number of students in the first year classrooms exceeding 100, manual attendance schemes are wasteful and result in poor utilization of the students' and teacher's time.

Human Face recognition using computerized systems has emerged as an active domain of research, which encompass disciplines like image processing, computer vision and machine learning. In spite of the other prevalent methods of identification, such as fingerprints, voice recognition, RFID or iris scans, which can be more accurate, face recognition is gradually evolving to a universal biometrics solution because of its non-invasive nature and people's primary means of person identification. The cost of sensors for such biometric attendance systems is quite high, owing to the fact that the sensors need to be highly selective for recognising one amongst 100 students.

- **Our Solution**

The purpose of this project is to construct an Attendance Monitoring System based on Accurate Head Counting, using validation by a real time registration system based on a Near-Field Network Technology. The proposed system consists of a high resolution digital camera mounted in the classroom to monitor the room. It is made to interface with a microprocessor which also interfaces with a motor, enabling to move the camera in diverse directions to capture different angles of the room. The images thus captured are stored and stitched together to make a composite image in the microprocessor for further processing, which includes face detection image processing algorithms. Also, a real time local server is set up in the room, which enables students to register their attendance for that class to granularly validate the head count result. The multithreaded capability of the proposed server enables multiple student attendance requests to be serviced simultaneously. Besides these features, the SSL supported server ensures protection against hacking of the attendance system. A database of the results is maintained, which, along with the estimated head count are communicated to the professor. This process **eliminates the need for extra stationery or personnel required** for monitoring the attendance, and also **removes any errors present in manual registration of attendance**. Thus, the proposed method also **removes any latency present** and hence presents an effective automated attendance scheme.