**PROJECT**

**AUTOMATED CROWD COUNTING**

**VII Semester, Shift I, B.E. CSE**

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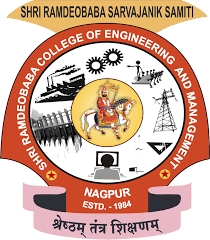
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**PROJECT NAME: AUTOMATED CROWD COUNTING**

**Problem definition**: In today’s era, population is increasing and thus demand for crowd counting is also increasing. In public transport, we often witness crowd disasters. Sometimes due to poor analysis, the hotels fail to effectively serve their customers. The restrooms at airports and railway stations are often not cleaned properly, so with the help of crowd counting, a system can be made to ensure proper cleaning of the rooms after the count reaches certain threshold.

**Aim & objective**: With this project of ours we are aiming to develop an approach and design a framework to tackle the problem of crowd disaster and analysis with the help of crowd counting.

**Benefits**: There has been a growing interest in automation and more intelligent systems than the current traditional approaches for the ease of application. Potential benefits of our project work are as follows:

1. **CROWD SAFETY**: This application can serve the purpose of collating reports of incidents to illustrate the common features associated with crowd safety.
2. **RETAIL SHOP ANALYSIS**: General count of customers in a retail shop on a daily basis for analysis of total sales on particular days.
3. **REST ROOM CLEANING**: This project can help the rest room managers to get an indication for cleaning the washroom once certain limit of people have used it.
4. **HOSPITAL EQUIPMENT ANALYSIS**: Number of beds can be checked as per the count of customers vary on a particular day or season and arrangement of equipments can be done for the same.
5. **MANAGEMENT OF PROVISION OF SERVICES**: Analysis of services (ticket counter, queue) to be provided as per the crowd count increases or decreases.

**Proposed plan of work**:

We have divided our project into two modules:

1. **Face detection**: For this module, we will be processing the image captured and detecting the faces from different orientations using image processing concepts and storing it in the database. OpenCV and dlib will be used for detection of faces. Once the faces are detected, the count will be calculated and stored. Log of people visiting a particular place on a regular basis will be maintained in the database.
2. **Training:** This module will be based on the training data set of the detected faces to make face detection even more accurate and removing difficulties like occluded face and make better detection of separate faces.
3. **Data Analysis**: The count of people observed and stored at different timings will be analyzed to maintain the security at crowdy places and avoid accidents. Business men can use this application to increase their revenues by analyzing the number of people visiting the shop on daily basis and can also analyze the crowd count on a monthly basis.

**Methodology**: The methodology of the proposed project is as follows: -

* An image will be captured and subjected to image processing.
* Libraries like open cv and dlib are applied to it for face detection.
* This image will then be stored in the database.
* The image will be enhanced further to give more accurate results and remove detection problems like face occluding by use of Machine learning results which are gathered from the already captured pictures of training dataset.
* The final result with enhanced accuracy will be stored in the database and then used for the required purposes.

**Technology**:

* **Image Processing:** It is used for analysis and manipulation of a digitized image, especially in order to improve its quality. OpenCV and dlib will be used for face detection.
* **Machine Learning:** It is the subfield of computer science that gives computers the ability to learn without being explicitly programmed.
* **SQL**: Originally based upon relational algebra and tuple relational calculus, SQL consists of many types of statements, which may be informally classed as sublanguages, commonly: a data query language (DQL), a data definition language (DDL), a data control language (DCL), and a data manipulation language(DML). The scope of SQL includes data query, data manipulation (insert, update and delete), data definition (schema creation and modification), and data access control. Although SQL is often described as, and to a great extent is, a declarative language (4GL), it also includes procedural elements.
* **JAVA/PYTHON**:Java/Python are interpreted, high level ,general purpose programming language.  It provides constructs that enable clear programming on both small and large scales. Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object- oriented, imperative, functional and procedural, and has a large and comprehensive standard library

**Deliverables**: Deliverables provided with this project will be a software that can automatically detect the count of people, avoid crowd disaster, perform the analysis at market, shops, public transport and enhance security.