

MES COLLEGE OF ENGINEERING, KUTTIPPURAM  
DEPARTMENT OF COMPUTER APPLICATIONS  
20MCA245 – MINI PROJECT

---

**PRO FORMA FOR THE APPROVAL OF THE THIRD SEMESTER MINI 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.)*

Mini Project proposal No: 1  
(Filled by the Department)

Academic Year:2020-2021  
Year of Admission:2020

1. Title of the Project : LIBRARY INTELLIGENT BOOK RECOMMENDATION SYSTEM  
USING FACIAL EXPRESSION RECOGNITION

2.Name of the Guide : PRIYA J D

3.Number of the Student: 1

4.Student Details (in BLOCK LETTERS)

Name DEVIKA P S

Roll Number 16

Signature



Date:1/12/2021

**Approval Status :** Approved / Not Approved

Signature of  
Committee Members }

---

**Comments of The Mini Project Guide**

**Dated Signature**

Initial Submission :

First Review :

Second Review :

---

**Comments of The Project Coordinator**

**Dated Signature**

Initial Submission:

First Review

Second Review

---

Final Comments :

Dated Signature of HOD:

## LIBRARY INTELLIGENT BOOK RECOMMENDATION SYSTEM USING FACIAL EXPRESSION RECOGNITION

DEVIKA PS

---

### **Introduction:**

This system recommends books based on user preferences. Before performing user facial expression recognition, standardized pre-processing of the acquired facial image data is required. Pre-processing includes image cropping, gray-scale processing, normalization processing, equalization processing, etc. Face detection is performed on the input image through the OpenCV built-in algorithm. Convolutional neural networks can quickly locate and segment facial images, and then learn and sample facial expression features in facial images. The neural network model classifies facial expressions of the input face image based on the learned features. The system selects the maximum probability value among different expressions as the output value. When the output value is "happy" or "surprised", it is judged that the user has a good impression of the type of book currently being browsed. Finally, recommendations are made based on the type of book the user likes.

### **Objectives:**

There are three main traditional book recommendation methods: Content Based Recommendation, knowledge Based Recommendation and Collaboration Filtering Recommendation. Content based recommendation makes the recommendation result tend to focus on a specific field, resulting in a high proportion of specific categories of items, ignoring the effective results of other categories. Due to the scarcity of scoring data, collaborative filtering algorithm has the problem of cold start. In order to increase the personalized function of the book recommendation system, we propose to obtain users' preferences through facial expression recognition to recommend books to users. On the one hand, the analyzed data is real-time and authentic; on the other hand, the recommended method has the characteristics of human-machine interaction and can provide timely information feedback.

### **Problem Definition:**

#### **Existing System:**

Facing the massive collection resources of library, many readers have no purpose and low efficiency when they borrow books. Traditional book recommendation methods mainly include book grading and book content recommendation. These methods have some problems, such as low recommendation effect, too centralized recommendation content and so on. With the in-depth study of recommendation system by many scholars, a variety of personalized book recommendation systems have been proposed. Through the analysis of big data, the method of recommendation based on users' borrowing records, browsing time, the number of clicks, etc. is adopted. These data are statistical information based on the historical records of user accounts, with inaccuracy and limitation. The same user account can be used by more than one person, so the book borrowing record has no pertinence to the user account. At the same time, new registered users have no record of borrowing books, and the book recommendation system will cause cold start problems.

## **Proposed System:**

The System **Library Intelligent Book Recommendation System Using Facial Expression Recognition** solve the above problems, this paper proposes that the library book recommendation system uses facial expression recognition technology to recommend books to users. Facial expressions are one of the most important features to reflect the human emotional state because they convey useful information to the observer. Obtain face image data through real-time cameras for analysis to determine user preferences. The recommendation system recommends books based on user preferences. Before performing user facial expression recognition, standardized pre-processing of the acquired facial image data is required. Pre-processing includes image cropping, gray-scale processing, normalization processing, equalization processing, etc. Face detection is performed on the input image through the OpenCV built-in algorithm. Convolutional neural networks can quickly locate and segment facial images, and then learn and sample facial expression features in facial images. The neural network model classifies facial expressions of the input face image based on the learned features. The system selects the maximum probability value among different expressions as the output value. When the output value is happy, surprised or including Sad, Fear, Disgust, and Angry, it is judged that the user has a good impression of the type of book currently being browsed. Finally, recommendations are made based on the type of book the user likes.

### **Basic functionalities:**

There are four types of modules. Administrator, Librarian, User and Emotion Detection Module. Each of them have distinct login section each of them can login their account section by conforming their unique username and password.

### **Administrator**

Admin can login the system using username and password. Admin can control the overall system and should have the functionality to monitor overall process.

When the Librarian and Users enters username and password, checking it with already registered username and password in the database will validate it.

Admin can control the overall workflow.

- View Users
- Add Libraries
- Add and manage Librarians
- View Booking Status
- View Books
- View Feedback

### **Librarian**

Librarian can login the app using his/her unique username and password. They can view rules and notification. The Librarian has the ability to add books and also he/she can view and manage the book list. They can add the summary list of each book uploaded

- Login
- Add and manage books
- Add summary of books
- View booking and buying status
- Payment
- Chat with user

## **User**

User must register before login. User can login the app using his/her unique username and password. User can view books and buy it.

- Login
- View Books
- View Library and Librarian
- Buy Books
- Cancel booking
- View Status
- View Summary
- Payment
- Feedback Send
- Chat

## **Emotion Detection Module**

Emotion is one of the very few words in the English language that do not have a concrete definition and it is understandable. It is abstract. Yet, almost every decision we have ever made in our lives is driven by emotion. Marketing research has proven that predicting sentiments correctly can be a huge source of growth for businesses and that's what we will be working on today — Reading Emotions. Expressions on the face are a vital mode of communication in humans as well as animals. Human behavior, psychological traits, are all easily studied using facial expressions. It is also widely used in medical treatments and therapies. The Face Emotion Recognizer (generally known as the FER) is an open-source Python library built and is used for sentiment analysis of images and videos. The project is built on a version that uses a convolution neural network with weights mentioned in the HDF5 data file present in the [source code](#).

**The flow of Logic:** The program starts by taking into input the image or video that needs analysis. The FER() constructor is initialized by giving it a face detection classifier (Open CV Haarcascade ). We then call this constructor's detect emotions function by passing the input object (image or video) to it. The result achieved is an array of emotions with a value mentioned against each. Finally, the '*top\_emotion*' function can seclude the highest valued emotion of the object and return it.

## **HARDWARE AND SOFTWARE REQUIREMENTS**

This specifies the Hardware and support Software required to carry out the development

### **HARDWARE REQUIREMENTS**

- Processor : Intel Pentium Core i3 and above
- Primary Memory : 4GB RAM and above
- Storage : 320 GB hard disk and above
- Display : VGA Color Monitor
- KeyBoard : Windows compatible
- Mouse : Windows compatible

### **SOFTWARE REQUIREMENTS**

One of the most difficult task is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements. The application requirement:

- Frontend : Html, CSS, Javascript
  - Backend : MySQL
  - Operating system : windows 7 or above
  - Technology Used : Python
  - IDE : Pycharm, Android Studio
  - Frame Work Used : Flask
-