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 : _____ *(Filled by the Department)*	Academic Year : 2021-2022 Year of Admission : 2020

1. Title of the Project : IDENTIFYING CUSTOMER INTEREST FROM SURVEILLANCE CAMERA AND SECURITY ALERT BASED ON DEEPLEARNING
2. Name of the Guide : FEBIN AZIZ
3. Student details (in block letters)

	Name	Register Number	Signature
1.	Anjali TP	MES20MCA-2008	

Date:16/04/2022

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 :

Signature of HOD

Dated

IDENTIFYING CUSTOMER INTEREST FROM SURVEILLANCE CAMERA AND SECURITY ALERT BASED ON DEEPLEARNING

ANJALI T P

Introduction and Objective:

Identifying customer's interests is valuable as it intuitively represents the product the customer wants. It can also be an effective marketing strategy for determining potential customers. Therefore, large retail vendors like Walmart and Costco analyze customer purchase history to identify customer interest. However, purchase history alone cannot fully determine how much interest in the product a customer has other than what they have purchased. In other words, products that the customer does not purchase but are interested can never be identified.

This project focuses on identifying a customer's interest based on behaviors from surveillance cameras. We detect the customer's gaze direction as this behavior accurately reflects customer interest in a particular product and also provide security of the shop .After closing the shop incase any person (thief) enter the shop suddenly click the images and send an alert to the shop owner with image .More specifically, we make the following contributions:

- A Facial emotion recognition (FER) dataset that contains various emotions, such as happy, sad, angry, etc.
- We experimented the state-of-the-art deep learning algorithms on the FER dataset to determine a suitable algorithm for identifying customer emotion. The experimental results demonstrate that deep learning algorithm is efficient in identifying customer interest.

In order to identify customer interest, it is necessary to analyze customer behaviors in a real-life shopping situation. In a real-life store, there is a shopping situation as well as general situations like walking, looking around something, and talking to each other. However, to effectively analyze customer behaviors while shopping, we need situations that represent customer and product. For this, we collected surveillance videos that contain various customer behaviors, such as stopping in front of a product and gazing at a product. The videos are obtained via YouTube, where we use different languages during the search to maximize the variety and number of videos. The dataset consists of the videos captured by real-world CCTV surveillance cameras, with various angles, different lighting conditions, and different resolution quality. This project proposes a method to identify customer's interests in the product through the estimation of gaze direction. For effective identification, the FER dataset with various quality and conditions, including various behaviors of customers in the real-world store, was proposed. Considering that the accuracy of gaze direction depends on face detection, we applied the state-of-the-art face detection algorithms to the FER dataset.

Problem Definition and initial requirement:

Existing System

Finding customer's interests is valuable. It can also be an effective marketing strategy for determining potential customers and if a customer walk into a super market there won't be enough staffs or salesmen to manage a bunch of customers. And the mentality of each and every customer is different from one another. There might be many customers who are not enough happy with that facility and they might be dissatisfied even if we provided as much staffs that we can afford. There will always have communication errors with the salesman and customer. For a shop customer is the primary investment so it's our responsibility to make the customer satisfied. Currently there is only customer purchase history to identify customer interest. However, purchase history alone cannot fully determine how much interest in the product a

customer has other than what they have purchased.If a person (thief) enter the shop ,we need only the cctv footages.In this project proposes an alert send to the shopowner with image.

Proposed System

This project focuses on identifying a customer's emotions through CCTV camera footages. We detect the customer's emotions and gaze towards a product in order to find interest in a particular product. We are using Facial Emotion Recognition data sets (FER) which contains emotions like happy, sad, angry, etc. If a person (thief) enter the shop ,we need only the cctv footages.In this project proposes an alert send to the shopowner with image.

I using Deep learning algorithms to process these data that obtained from Facial emotion recognition (FER) data set.

For identifying customer interest in a particular product, what is their emotion towards the product experience and also their emotion towards customer services is also monitored and analyzed in real world shopping condition. In a real-life store, there is a shopping situation as well as general situations like walking, looking around something, and talking to each other. However, to effectively analyze customer behaviors while shopping, we need situations that represent customer and product. For this, we collected surveillance videos that contain various customer behaviors, such as stopping in front of a product and gazing at a product. The videos are obtained via YouTube, where we use different languages during the search to maximize the variety and number of videos. The dataset consists of the videos captured by real-world CCTV surveillance cameras, with various angles, different lighting conditions, and different resolution quality. This project proposes a method to identify customer’s interests in the product through the estimation of gaze direction. For effective identification, the FER dataset with various quality and conditions, including various behaviors of customersin the real-world store, was proposed. Considering that the accuracy of gaze direction depends on face detection, we applied the state-of-the-art face detection algorithms to the FER dataset and provide security to the shop and send alert to the shop owner.

Basic functionalities:

Functional Module

Deep Learning:

Deep learning is a subset of machine learning, which is essentially a neural network with three or more layers. These neural networks attempt to simulate the behavior of the human brain—albeit far from matching its ability—allowing it to "learn" from large amounts of data. While a neural network with a single layer can still make approximate predictions, additional hidden layers can help to optimize and refine for accuracy.

Deep learning neural networks, or artificial neural networks, attempts to mimic the human brain through a combination of data inputs, weights, and bias. These elements work together to accurately recognize, classify, and describe objects within the data.

Deep neural networks consist of multiple layers of interconnected nodes, each building upon the previous layer to refine and optimize the prediction or categorization. This progression of computations through the network is called forward propagation. The input and output layers of a deep neural network are called visible layers. The input layer is where the deep learning model ingests the data for processing, and the output layer is where the final prediction or classification is made.

Another process called backpropagation uses algorithms, like gradient descent, to calculate errors in predictions and then adjusts the weights and biases of the function by moving backwards through the layers in an effort to train the model. Together, forward propagation and backpropagation allow a neural network to make predictions and correct for any errors accordingly. Over time, the algorithm becomes gradually more accurate.

User Module:

1. Admin
2. Staff
3. Security

Admin:

- Add and manage Staffs
- Add and manage camera
- Send Notification to Staff
- View Notification
- Assign work to staff
- View work status
- View frequent Pattern
- View Records

Staff:

- Login
- View works and update status
- View notification from admin
- View notification from camera
- Add bill information

Security:

- View camera notification
- Update daily report

Tools / Platform, Hardware and Software Requirements:

Hardware Requirements:

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.

- Processor - Intel x86
- Speed - 1.1 GHz
- RAM - 700 MB (min)
- Hard Disk - 150 MB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVG

Software Requirements:

One of the most difficult tasks 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:

- Operating System - Windows 7 or Above, Android
- Technology - Python, Java
- Backend - MySQL
- Platform used - JetBrains, PyCharm, Android Studio
- Web Browser - Google Chrome, Fire fox, Microsoft Edge
- Front End - HTML, CSS, JAVASCRIPT
- Frame work - Flask

Workflow Of Project

We detect the customer's gaze direction as a method to identify customer interest. The process of identifying customer's interests contains three steps: input video, detect a face, and estimate gaze direction. We use the FCE dataset proposed in this Project as an input video. It is essential to accurately detect a face as it influences the accuracy of gaze direction.The face detection and processing are done using deep learning. The collected FCE data sets containing CCTV camera footages processed to find the emotions of the customers.