Digital In-store Merchandising

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ABSTRACT

Lovation Basd Aadvertising is one of the forms of advertising in which a person passing by a store get advertising messages by using his/her location. So for that, one need to turn on the location access permission which lead to privacy issues. One more is Bluetooth Based Advertising in which a person can communicate with the store and get advertisements via Bluetooth again for this, one need to enable the Bluetooth in phone. Digital In-store Merchandising has came with solutions. A person doesn't need to carry any phone or enable Bluetooth in phone. A person will walk into the mall a camera will capture the image and attributes will be collected such as age, gender base on that ads will be predict and display on the screen of that mall.

Keywords : IOT, Image Processing, Merchandising, Mall, Data Set

I. INTRODUCTION

We are developing a system called Digital In-store Merchandising basically it deals with advertising of available products inside a store or mall based on the customer via a display device. There will be a camera at the entrance of the mall or store, camera will capture the customer's image while entering the store or mall, captured customer's image will be then processed by image processing algorithm with the help of Raspberry pi processor. At the end of image processing we will be getting the attributes of customer like gender, age, cloths, objects such as spectacles or cap, each attribute will be unique based on the customer. After this, products which will be best suited for each customer will be predicted and displayed on the display device inside the mall along with customer's image.

In order to process image we are using Deep learning techniques, we are using CNN (Convolutional Neural Networks).

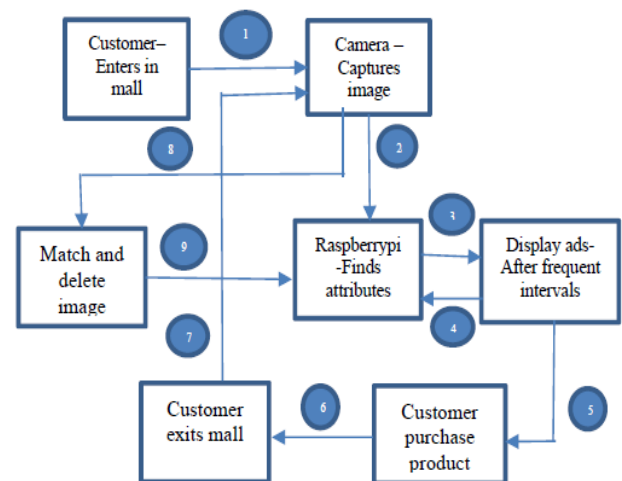Our main aim is to boost the sales of the mall or shop wherever this system will work.

Figure 1:System Architecture

A. CNN(Convolution Neural Network)

Face recognition can be done by using Convolution neural network algorithm[6]. CNN consists of two layers feature extraction layer and feature map layer . In feature extraction layer each neuron is connected to local receptive fields of previous layer and extracts the local feature . After local feature is obtained relationship between them and other features are gathered. CNN needs to be trained prior to the testing, images of each individual with various poses are first given to the model, but it takes huge amount of time for training and once trained the output is accurate.

B. Effect of Recommender Systems on sales

Recommendation of products increase the sales of a store and customer saves time in selecting the products[15]. Recommendation helps the customer to select products that are best suited for him or her by analyzing the present outfit. Customer can find all the products at one place.

II. LITERATURE SURVEY

Here we have discussed the literature review of existing techniques:

Onkar Ghate, Gurunath Chavan, Krutika Dongare and Snehal Mangale [1] proposed A Bluetooth Based Advertisement System for Mall in this system they have created an android app using which customer's mobile phone will be connected to nearest Bluetooth access point and then he/she can browse shops in the mall, search products in the mall and can even get information about offers on various products. In this system customer needs to carry his/her mobile phone to get the facilities.

Christine Bauer and Christine Strauss [2] proposed A Location Based Advertisement System in which consumers can get advertisements on their mobile phones individually (based on their current location) and dynamically (in real-time). Again, in this system customer needs to carry mobile phones to get advertisement. It may privacy issues also.

Keerti. S. Mahajan, S. S. Jamsandekar and Dr. A M. Gurav [3] proposed Machine Learning Approach for Marketing Intelligence: Managerial Application in this paper they have told about growing popularity of social media platforms like:Facebook, Twitter, Whatsapp and Instagram, etc. and they are source of huge dataset, we can use machine learning to process this huge dataset and understand customer's behavior and provide them suitable advertisements. In this system there is need of prior knowledge of the customer to predict advertisement.

T. Thiraviyam [4] proposed Artificial Intelligence Marketing from this paper we can understand that how AI is useful for both customers and marketers. AI system can assist customers 24*7. It can understand customer behavior and can predict advertisements to customers. It can handle several customers requests simultaneously, so that waiting time can be reduced to nil. Similarly, it is useful for marketers as personalized advertisements can be created for the customers to boost up sales. But there are some limitations of this system that is AI is limited only by the availability of data.

Daniel S´aez Trigueros, Li Meng and Margaret Hartnett [5] wrote research paper on Face Recognition: From Traditional to Deep Learning Methods in this paper they have mention that, the main advantage of deep learning methods i. e. they can be trained with very large datasets to learn the best features to represent the data. CNN based face recognition methods trained with these datasets have achieved very high accuracy as they are able to learn features that are robust to the real-world variations present in the face images used during training. A face recognition system finds the position of the faces in an image and (if any) returns the coordinates of a bounding box for each one of them. Convolutional

neural networks (CNNs) are the most common type of deep learning method for face recognition. Collecting large amounts of labeled face images is expensive, and very deep CNN architectures are slow to train and deploy. Generative Adversarial Networks (GANs) are a promising solution to the first issue.

The overall finding of the above discussion is given below as Table-1

Sr. No.	Paper Name	Author	Method Proposed	Limitations
1.	BlueTech: A Bluetooth-Based Advertisement System for Mall	Onkar Ghate, Gurunath Chavan, Krutika Dongare, Snehal Mangale	Advertisement using Android app using Bluetooth connectivity	Customer need to carry Mobile Phone, Short range of Bluetooth
2.	Reaching Consumers Individually at the Right Place: A Literature Analysis of Location-based Advertising on Mobile Devices	Christine Bauer and Christine Strauss	Advertisement using Mobile location of customer	Customer need to carry Mobile Phone, Privacy issue
3.	Machine Learning Approach for Marketing Intelligence: Managerial Application	Keerti. S. Mahajan, S. S. Jamsandekar, Dr. A M. Gurav	Using Machine Learning to analyse customer behavior and predict Advertisement	System should have some prior knowledge of customer
4.	ARTIFICIAL INTELLIGENCE MARKETING	T. Thiraviyam	Using Artificial Intelligence to analyse customer behavior and predict Advertisement	System should have some prior knowledge of customer
5.	Face Recogni	Daniel S´aez	Recognition of	Collecting

	TION: FROM TRADITIONAL TO DEEP LEARNING METHODS	TRIGUER OS	FACE USING CNN	LARGE AMOUNTS OF LABELED FACE IMAGES IS EXPENSIVE

III. TAXONOMY CHART

	BLUETOOTH CONNECTIVITY	MOBILE LOCATION	MOBILE DATA	NEED PHONE	PRIOR KNOWLEDGE OF CUSTOMER
BLUETOOTH BASED SYSTEM	✓	✗	✗	✓	✗
LOCATION BASED SYSTEM	✗	✓	✓	✓	✗
MACHINE LEARNING APPROACH	✗	✗	✓	✓	✓

ARTIFICIAL INTELLIGENCE APPROACH	✗	✗	✓	✓	✓
DIGITAL IN-STORE MERCHANDISING	✗	✗	✗	✗	✗

IV. CONCLUSION

Based on all the data that have been explained before , we can understand that Digital in-store merchandising is very profitable for the shop owners as well as the customers. As there is no such system developed to recommend person specific advertisement.

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