**International Institute Of Professional Studies**

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**Department of Information Technology**

**AI Based Vision Analyzer**

A Major/Minor Project Report

Submitted in partial fulfillment of requirement of the

Degree of

**MASTER OF TECHNOLOGY**

**in**

**INFORMATION TECHNOLOGY AND ENGINEERING**

BY

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Under the Guidance of

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**Report Approval**

The project work **“AI Based Vision Analyzer”** is hereby approved as a creditable study of an engineering/computer application subject carried out and presented in a manner satisfactory to warrant its acceptance as prerequisite for the Degree for which it has been submitted.

It is to be understood that by this approval the undersigned do not endorse or approved any statement made, opinion expressed, or conclusion drawn there in; but approve the “Project Report” only for the purpose for which it has been submitted.

Internal Examiner

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Designation:

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Designation:

Affiliation:

**Declaration**

I/We hereby declare that the project entitled **“AI Based Vision Analyzer”** submitted in partial fulfillment for the award of the degree of Bachelor of Technology/Master of Computer Applications in ‘Computer Science’ completed under the supervision of **Shaligram sir, Assistant Professor(CSE),** Faculty of Engineering, International Institute of professional studies, DAVV Indore is an authentic work.

Further, I/we declare that the content of this Project work, in full or in parts, have neither been taken from any other source nor have been submitted to any other Institute or University for the award of any degree or diploma.

**Sulbha Mishra (IT-2K17-57)**

**Aashutosh Bansal (IT-2K17-02)**

**Certificate**

We, **Sulbha Mishra (IT-2K17-57), Aashutosh Bansal (IT-2K17-02)**  certify that the project entitled **“AI Based Vision Analyzer”** submitted in partial fulfillment for the award of the degree of Master of Technology by **Sulbha Mishra, Aashutosh Bansal** is the record carried out by them under my/our guidance and that the work has not formed the basis of award of any other degree elsewhere.

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**Sulbha Mishra, Aashutosh Bansal**

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**Abstract**

There has been a huge progress in computer vision since last decade. AI is an important component of this system. In this project we are providing a model of surveillance system which gives artificial intelligence to the camera. We have given the camera an ability to detect objects, count the number of people in a particular region of a video. This is called object tracking which requires object detection. The main idea is to track customers and know their interest in a particular product or in which region they are standing. This would analyse a particular area (region) with given video thereby making the system cost efficient and suitable for practical applications. The paper includes image processing techniques which will be useful for the camera to detect and count objects. We have implemented this system in ideal conditions considering the area is less populated. This project will implement a prototype for smart object detection which will help in marketing of products and making supermarkets smarter and more advanced.

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**INTRODUCTION**

**1.1 Introduction**

The marketing of product and safety are one of the major concerns of any organization in the present age. A company put a lot of resources and wealth in understanding and analyzing product demand for customers to increase marketing of that product and many organizations also need surveillance for particular areas. Thus, there is a need for a smart system which is both cost and application efficient. The traditional method used for surveillance has been manpower. But with the need for 24 hours surveillance and security, came into existence the AI based smart systems. These traditional camera systems lacked the intelligence of the humans and it was challenging to cover a large area with these systems as it would require a greater number of cameras and manpower to monitor and analyze a region. So, there is a need to combine both the intelligence of humans and the working efficiency of camera systems to come up with a modern “AI based analyzer”. Here the analyzer will have the ability to get the detailed analysis of a particular region in a video like counting the number of people entering in that region, exiting that region, analysis for maximum time. This project describes such an intelligent system which can be brought up into practical applications. Image processing is an important part of the entire operation. The efficiency of the algorithm used for image processing determines the efficiency of the entire system.This project describes such intelligent systems which can be brought up into practical applications. Image processing is an important part of the entire operation and displaying the real time data.

**1.2 Aim**

To design and develop detailed analysis of a particular region in a video like counting number of people entering in that region, exiting that region, analysis for maximum time and visualize real time counting of people in mobile application.

**1.3 Objective**

· To Detect interested objects(Human) in a video stream.

· To count objects(Human) in every single frame.

· To generate data, every second is near the targeted product.

· To calculate average counting(per day) of persons near the targeted product.

· To calculate percentage popularity of targeted products.

· To develop mobile applications to visualize average counting( real time analysis of targeted product).

**1.4 Goal**

Project goals are :

* **Product Analysis**: Understanding Demand of product in market by analyzing how many customers are interested to buy products by determining number of customers standing near particular product using our project **AI Based Vision Analyzer**.
* **Mobile Application:** Develop a user friendly interface to display real time counting of people near product and percentage popularity of product.
* **Real Time Alerts**: There are two types of alerts that can be generated by AI Based Vision Analyzer, user defined alerts and automatic unusual activity alerts. User Defined Alerts: Here the system is required to recognize a variety of user defined events that occur in the monitored space and notify the user in real time, thus providing the user with an opportunity to evaluate the situation and take preventive action if necessary.
* **Automatic Unusual Activity Alerts**: Unlike the user defined alerts, here the system generates alerts when it detects “activity that deviates from the norm”.
* **Restricting Area**: Restricting someone to enter the suspicious user defined region by generating alerts if in case person enters in that area.

**1.5 Methodology**

The project plan is to carry the design and implementation of the project in completely step-by-step manner. The entire project is divided in following phases :-

**Phase 1- Study and Analysis Phase**

* Questionnaire done to know the facilities and problem encountered by the management team of supermarket
* Statistical analysis done one the basis of questionnaire.
* Interview of supermarket Manager and marketing team lead Ms. Ajay jain and Ms Diwakar .Present system functionality, its problems were completely understood. Information regarding the project was taken.
* Design a formula for calculation of percentage popularity for limited view

**Phase 2- Design Phase**

* In this phase the database design of the system is made. The database design is being carried in the following steps-
* Identified the entities and their relationship from the scenarios.
* Designed ER model for the proposed system and relation among these entities
* Designed architectural context modal to know how to generate the log file (contains the information of object count and popularity of object)
* We design our system in such a way that a text and CSV file is generated to represent the data in tabular format and it contain average percentage popularity of every minute which is shown in the mobile application

**Phase 3- Coding Phase**

* We did actual coding by the help of architectural context design
* Researched for the best algorithm to detect/track/count the objects
* The design of the system is implemented through actual code.
* Proper validation of data is used
* Proper validation on important fields provided
* User does not need to have the knowledge of the code, output is defined user friendly

**Phase 4- Testing and Implementation**

* Testing is done on various test cases and data sets. Testing is applied on-
* Testing on each form by taking different user cases.
* We implemented our project in a small supermarket
* Testing is done by-
* Black box testing, white box testing and unit testing

The above plan follows the software development life cycle (SDLC) model for the development of the proposed system,