**International Institute Of Professional Studies**

**2020-2021**

**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

Name:

Designation:

Affiliation:

External Examiner

Name:

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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Mr. Shaligram Prajapat

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**Acknowledgements**

I would like to express my deepest gratitude to Honorable Chancellor, **Shri R C Mittal,** who has provided me with every facility to successfully carry out this project, and my profound indebtedness to **Prof. (Dr.) Sunil K Somani,** Vice Chancellor, Medi-Caps University, whose unfailing support and enthusiasm has always boosted up my morale. I also thank **Prof. (Dr.) D K Panda,** Dean, Faculty of Engineering, Medi-Caps University, for giving me a chance to work on this project. I would also like to thank my Head of the Department **Prof. (Dr.) Suresh Jain** for his/her continuous encouragement for betterment of the project.

I express my heartfelt gratitude to my **Internal Guide, Mr. Yogesh Kakde, Assistant Professor, Department ofComputer science & Engineering, MU**. without whose continuous help and support, this project would ever have reached to the completion.

It is their help and support, due to which we became able to complete the design and technical report.

Without their support this report would not have been possible.

**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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**SYSTEM REQUIREMENT ANALYSIS**

**2.1 Information Gathering-**

During an AI development, we always rely on data. From training, tuning, model selection to testing, we use three different data sets: the training set, the validation set ,and the testing set. For your information, validation sets are used to select and tune the final ML model.

Sometimes gathering of data is enough but it is the opposite in many cases. In every AI project, classifying and labeling data sets takes most of our time , especially data sets accurate enough to reflect a realistic vision of the market/world ,in this project YOLO model does this task for us.

**2.2 System Feasibility**

**2.2.1 Economical**

Today, the Data Scientists or Machine Learning stand between the truckloads of data and the generalist business users by extracting the meaning or intelligence out of the data with proven algorithms. The actual goal of AI practitioners is to bring ML to a point where average business users will not need the help of Data Scientists to use ML algorithms. In an algorithm economy, the pre-made algorithms will be smart enough to study and learn from data to improve the algorithmic models for more effective use later.

This application provides a ML based solution that will aid the advantage for an organization in handling many issues economically. ML has even proven to generate accurate solutions when perfect data did not exist. Now, given the growth of smart algorithms, Business Analytics will move beyond Descriptive and Predictive, and gradually launch Prescriptive Analytics as the sole preoccupation of business leaders

**2.2.2 Technical**

**2.2.2.1 Software Requirement**

* **Development Tools** :

PythonIDLE,Kaggle, JupyterNoteBook

* **Machine Learning Model:**

YOLO

* **Operating System** :

Ubuntu 16.4, Windows 10

* **Libraries Used** :

Pandas, Numpy, Keras, OpenCV, Tensorflow

**2.2.2.2 Hardware Requirement :**

* Processor : Intel core i7 and above
* System Type : 32-bit or 64-bit
* RAM : Minimum 4 GB
* Hard Disk : Minimum 10 GB

**2.2.3 Behavioral**

Vision based analyzer is a systematic approach to understand and analyze the movement of people in camera captured content. It comprises fields such as Biomechanics, Machine Vision, Image Processing, Artificial Intelligence and Pattern Recognition. It is an interdisciplinary challenging field having grand applications with social, commercial, and educational benefits. A wide spectrum of applications demands human motion recognition. The applications are spread over domains like sports, medical, surveillance. Some of the applications for highlighting the potential impact of human motion recognition are

**2.2.3.1 Smart Surveillance**: In today’s surveillance systems, video contents are viewed continuously by human operators. With the increasing number of cameras, it is impossible for humans to monitor all the contents 24 X 7. Generally, the contents are viewed after a mishap to analyze the event. So, there is an intense requirement of smart surveillance systems from the security agencies that count the number of people near the particular area.

**2.2.3.2 Marketing**: Computer vision (CV) has evolved tremendously over the years, adding existing capabilities to the field of marketing. Using artificial intelligence and machine learning, this technology enables computers to gain a visual understanding of the world. Much like how people are attracted towards a particular product and which product is getting the highest attention, all these things are done through a video. Computer vision can scan images and translate their contents into metadata. Marketers can then collect, organize, and assess that data to enhance their marketing efforts.

**2.3 Platform Specification (Development & Deployment)**

**2.3.1 Software Implementation**

**First task :**Implementing YOLO Model by using following steps

## **Step 1 - Requirements**

· Anaconda – Python 3.6 (Win 10) <https://www.anaconda.com/download/>

· Conda Env – Yolo.yml

� <https://github.com/reigngt09/yolov3workflow/tree/master/2_YoloV3_Execute>

cd C:\yolo

conda env create -f yolo.yml

If that does not work, try installing the dependencies with:

pip install -r requirements.txt

· CUDA Toolkit - V9.0 (Nvidia GPU – GTX 1050 or higher) CUDA and CuDNN can now be installed via Anaconda, but if you choose to install them using the olskool method then follow the links below.

� <https://developer.nvidia.com/cuda-90-download-archive?target_os=Windows&target_arch=x86_64&target_version=10&target_type=exelocal>

· CuDNN - V 7.05

o � <https://developer.nvidia.com/rdp/cudnn-archive>

o Copy the following files into the CUDA Toolkit directory.

§ Copy \cuda\bin\cudnn64\_7.dll to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v9.0\bin.

§ Copy \cuda\ include\cudnn.h to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v9.0\include.

§ Copy \cuda\lib\x64\cudnn.lib to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v9.0\lib\x64.

o Add the following paths to Environmental Variables C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v9.0\bin

§ C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v9.0\include

§ C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v9.0\lib\x64

o Ensure that you have the latest nvidia graphics drivers install on your PC. You can do this from the nvidia website.

## **Step 2 - PyTorch Yolo v3**

Change directory to a workplace where you want to download the repo

· Clone Yolo v3 Repo

o git clone https://github.com/ayooshkathuria/pytorch-yolo-v3.git

· Download the Weights

�<https://pjreddie.com/media/files/yolov3.weights>

## **Step 3 - PyTorch Yolo v3**

· Change Directory to cloned repo

cd C:\yolotorch

· Download any test video (.mp4/.avi)

· Run demo on video

python video\_demo.py --video video.mp4

· Run demo on webcam

python cam\_demo.py