

Object Detection Using Deep Learning and Artificial Intelligence in E-Commerce

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Abstract -- Object detection in E-commerce is a revolutionary concept which will take E-commerce to another level. One can compare the price of different products from various web merchants. Labeling, Categorizing, screening various E-commerce website for the same product can be tedious and take valuable time. Image analysis utilizing machine learning can ease the process and make it faster than ever. This project allows the customer to select from a variety of range and at the same time can compare the different parameters and selects the best out of it, and all this by just clicking the picture of the product you want. Since E-Commerce is a constantly growing and competitive market, comparing product prices is an important task for online retailers as well as for e-shoppers. Since web costs are refreshed once per day or significantly more regularly and there is an immense number of items offers on the Web the item and value information should be distinguished, gathered and thought about by a computerized methodology. This project contributes a novel approach for the automated identification and extraction of product price data from arbitrary e-shop websites which are independent of the E-shops' language and the product domain. The project is an android application to scan an object of desire and get various prices through the online merchants or e-commerce websites in the form of a list and then once you select an option it provides you with the buying option and also recommendations related to the product you selected making the whole shopping experience much easier and faster. And the main key point of the project is to get the user the best price for the desired product without going through the hassle of scrolling and comparing individual sites one after another.

Indexed Terms — object detection, artificial intelligence, deep learning, image classification, e-commerce

I. INTRODUCTION

Object Detection ^[3] Using Deep Learning and Artificial Intelligence In E-Commerce. What is E-commerce? E-commerce business, otherwise called electronic trade or web trade, alludes to the purchasing and selling of merchandise or administrations utilizing

the web, and the exchange of cash and information to execute these exchanges. Internet business is frequently used to allude to the closeout of physical items on the web. The use of E-commerce is increasing day by day to challenge the business of retailers.

The term “Object Detection” is the process of finding instances of the real-world objects such as faces, bicycles, fruits etc. In recent times artificial intelligence and machine learning are the two main concepts which are widely used. Deep learning is a subfield of machine learning worried about calculations motivated by Artificial Neural Network. In deep learning, each dimension figures out how to change its input information into a marginally progressively theoretical and composite portrayal. In an image recognition application, the crude info might be a framework of pixels; the principal authentic layer may digest the pixels and encode edges; the second layer may make and encode game plans out of edges; the third layer may encode a nose and eyes; and the fourth layer may perceive that the picture contains a face. Essentially, a deep learning procedure can realize which highlights to ideally put in which level on it possesses. Artificial Intelligence is an intelligence demonstrated by machines in contrast to natural intelligence inspired by human and other animals. Computerized reasoning is a part of software engineering that intends to make astute machines. It has transformed into a crucial bit of the advancement business. Research related to computerized reasoning is profoundly specialized and concentrated.

II. MODULAR DESCRIPTION

A. Objective

The objective of the project is divided into 3 main parts they are as follows:

- Firstly, the scanner will detect the object by capturing a picture of it and with the help of RCNN (Regions with Convolutional Neural Networks), this

picture will be converted into a dataset of pixels and later used for the detection by the neurons.

- Once, the object is scanned, and detected, with the help of web mining a comparison based on a price, relation, distance etc will be carried out and results will be displayed to the user.
- Based on the object detected recommendations will be prepared using artificial intelligence.

B. Problem Definition

To create a system that scans real-time [6] world objects and identifies them based on deep learning algorithms. There are three phases: detection, comparison, recommendation. With the help of RCNN the image of the object will be scanned, once the object is detected it will be compared using web mining and finally, the optimized result will be recommended to the user.

- Web-based application.
- Business and corporate websites
- Social Networking websites.
- Custom CMS (Content Management System)
- Custom CRM (Customer Relationship Management)

Regarding speed, this framework significantly reduces the amount of code required for building large and complex applications. One more favorable position of ASP.NET is execution, which is expanded by without a moment to spare accumulation, brilliant storing innovations, and local enhancement. Moreover, the budgeting and support of asp.net development cost is effective. ASP.NET offers flexibility and scalability that PHP can give only with various frameworks at different levels.

B. SQL SERVER

Microsoft SQL Server is a relational database management system, or RDBMS, that underpins a wide assortment of exchange preparing, business knowledge and examination applications in corporate IT situations.

It is used as the backend for the website where all the product information is stored and products are displayed.

C. TENSOR FLOW

Tensor Flow[2] is an open source programming library for elite numerical calculation. Its adaptable design permits simple arrangement of calculation over an assortment of stages (CPUs, GPUs, TPUs), and from work areas to bunches of servers to versatile and edge gadgets. At first, made by pros and designers from the Google Brain assemble inside Google's AI affiliation, it goes with strong help for AI and significant learning and the versatile numerical estimation focus is used transversely over various other sensible spaces. TensorFlow was initially created by analysts and specialists taking a shot at the Google Brain group inside Google's Machine Intelligence Research association for the reasons for directing AI and profound neural systems investigate. The framework is general enough to be relevant in a wide assortment of different spaces, also. TensorFlow gives stable Python API and C APIs just as without API in reverse similarity ensure like C++, Go, Java, JavaScript, and Swift.

III. METHODOLOGY

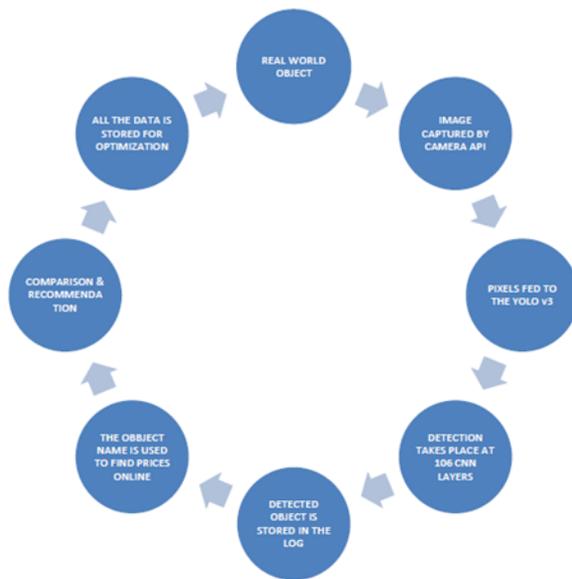


Figure 1.1 - Steps of Object Detection.

As far as the scope of this paper is concerned, we describe the following technologies:

A. ASP.NET

One of the key advantages of ASP.NET is that it permits assembling an assortment of web arrangements, for example,

D. ANDROID STUDIO

Android Studio is an IDE (Integrated Development Environment) to develop android apps. It gives us a proper environment for developing and for coding of Android apps, right now there are two languages in which android native apps are developed:

- Java
- Kotlin

a large portion of the applications accessible in play store is created in java just, in light of the fact that kotlin is another dialect comes in android advancement.

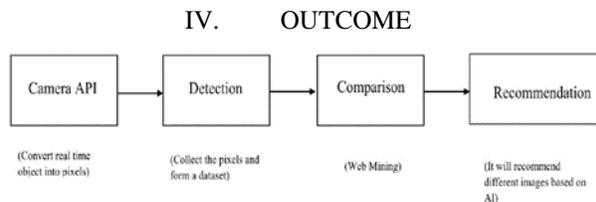


Fig 1.1 - Basic block diagram of a typical object detection/recognition and recommendation system.[1]

A. Object Detection

When the application is launched the Camera API is opened. With this camera, real time objects are detected using tensorflow. The captured image will be converted into digital form and perform some operation which will provide us with some useful information for classification.

Steps in object detection:

1. First the camera api will be launched.
2. This camera api will capture the 2D image of the object.
3. It will then detect the boundary of the object and outline will be created.
4. After determining the boundary, colour profile of the image is considered for further classification.

B. Classification^[3]

For classification first, we need to teach computer how a cat, dog, bird, etc look like before it is able to recognize new object. There are various classification made in the database based on different categories. Categories include fruits, food item, shoes, clothes,

animals, birds, objects, plants, trees, etc. The detected object is then classified based on colour properties, size, structure, etc. For example, if there is an apple, it will display result as apple, fruit. The backend processing for this will be detection of object and classified according to colour and shape of the object.

C. Variables

Based on the various class name, each class category would have a certain product list. This entire product list of the variable class category would be displayed.

V. CONCLUSION

With the help of android application for object detection we can easily detect any object and search for the availability of the object as well as compare its prices amongst various websites where the product is actually available. With the help of various technologies like Deep-learning and Artificial Intelligence the task of searching for any object by typing its name will be reduced. The time consumption for searching information about any object will be reduced by using object detection application.

VI. FUTURE SCOPE

The current research project is capable of only monotonous object detection. In the future scope of the research project, Augmented reality could be added which aids in better accuracy and wider classification.

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