Using APIs to display information in AR headsets

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Abstract - **Augmented Reality is a new and emerging technology and many researches and development are undergoing on it. Recent advancements in recognition of objects and characters present in an image or video have also come to an accuracy level which can be classified as reliable. In this paper, I propose an idea of implementation of different API's to gather details about object present in the view. These objects may be a vehicle, buildings, book or a person. The whole process is broken down into 3 steps, pre-processing, object recognition and information gathering. Pre-processing is done to manipulate the image to help in object recognition such as changing the perspective or crop, object recognition is sending the image to API servers to recognise the object present in the view, and information gathering is to use the details about an object to find more details about it. For example, if there is a car in the view, pre-processing will modify the image, object recognition process will gather few details about it like make and model and then this information can be sent to another API to gather complete details about it.**

Keywords: --- **APIs, Object recognition, Augmented Reality.**

I. INTRODUCTION

Augmented Reality is technology in making. Several researches are going on its development due to its possible implementation in daily and professional life. Movies and Novel has already shown us a glimpse of its implementation. Recognition and displaying information about the objects present in the view is one of its implementations. In RoboCop we have seen cop recognizing a criminal in the crowd of hundred. Days aren't far when such incident will take place in reality. However AR headset has a problem which is to fit such power hardware in compact size to be fitted in a size of spectacles. For this problem I propose to use APIs to reduce the workload on the AR headsets. APIs need data in a specified format and returns the information offered. All the action takes place on its server, so AR headsets will need just a good internet connection so that AR headset can transfer data to and fro continuously.

II. BASIC ARCHITECTURE.

View capture and create module (VCDM) is a program designed to capture the image in the view (captured from the camera of the AR headsets) send these images to APIs and display the information. It may also has inbuilt algorithm to recognise the objects present in the image. VCDM also has different settings which enables user to control the type of information he/she wishes to see.
The object is extracted from the image and is to be sent toAPIs for basic information gathering. These information are again sent to specialized API to gather complete information required and discard the non-relevant information Function of VCDM are:-

➔ Capture the view and sent it to APIs.

➔ Store the basic information returned by API and converts them in required format by specialized API for complete information gathering.

➔ Classify the Information received by the API, store relevant information and discard the irrelevant ones.

➔ Convert the received information in a format to easily display.

➔ Keep learning about the user preferences.

III. VIEW CAPTURE AND CREATE MODULE

The View of the AR is to be captured as image to cut the processing load and upload the images to API for information gathering. This will be done by View capture and display module. This module also contains inbuilt object recognizing algorithms which can recognise objects present the view. After the recognition of the object, the image containing the object is sent to the respective API for further information gathering. After the API returns the Information to the module, the module displays the information on the basis of user settings and searches for more details (if user settings says so) about any particular object by sending the objects details to a specialized API. One of such specialized API is carqueryapi for 4 wheeler. User can set the details he/she wishes to see about any particular category of object. For example a gadgets enthusiast can set to see all details about gadgets and skip detailed info about other object category.
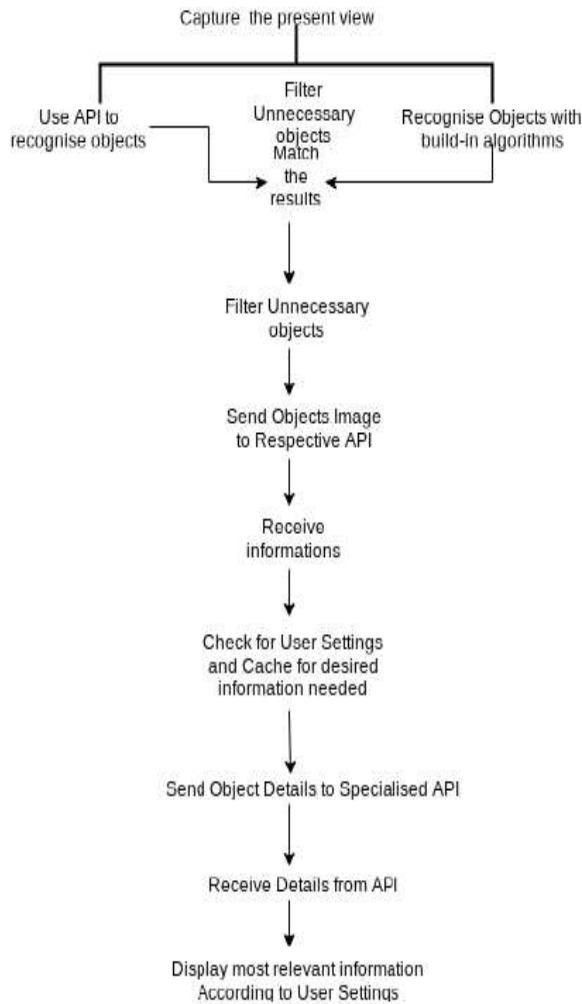
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Fig 1: Working of VCDM module

IV. RECOGNIZING OBJECTS.

Though we know almost all the details about the object we come across daily but there are situation we don't or we don't know enough. For such cases object recognition comes handy. there are over thousand of open source and paid APIs for such operations. Cloud vision by Google and Computer vision by Microsoft are best among them, but they don't come handy as they show only the basic details. However they are highly accurate and preferable to gather the basic details and then for detailed information other specialized API should be used. This feature is convenient for product showcase at showrooms

where seller get highly attractive product showcase and buyer get reviews, price comparison and similar products.

V. RECOGNIZING AND TRANSLATING TEXTS

Characters (text) extraction is very important to translate them to multiple language. Computer Vision service from Microsoft azure and Freeocr API can be used for to extract the text present in the view. The benefit of using multiple API for text extraction is to increase the accuracy. After the extraction of text, it can be sent to other API for translations into preferred language(s) chosen by the user.
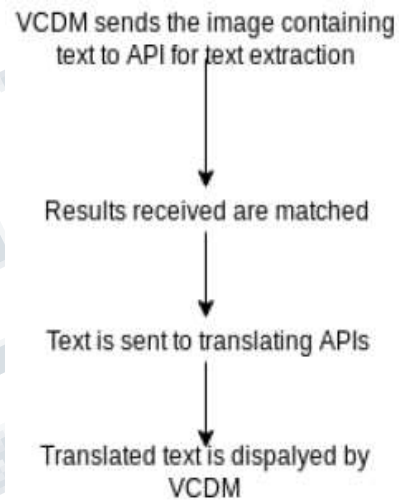

Fig 2: flowchart of text translation.

VI. RECOGNIZING VEHICLES.

Fewer are the people who are not interested in vehicles, however having the knowledge of vehicles is not so common though desired by all. recognition of a vehicle comes handy by use of APIs. For recognition, image of vehicles should be sent to API and it will return the details about it. But the problem was APIs which can recognize the vehicle year, make and model are not offering complete details about this which may be desired by the user. For this we will send the year, make and model to carqueryapi which has all possible details about cars and bikeindex APIv3 for bikes. Details about vehicles is not restricted to its build but ownership, reviews and pricing chart. Ownership details API are available for few countries and few other are in development and is likely to be available from 2020.
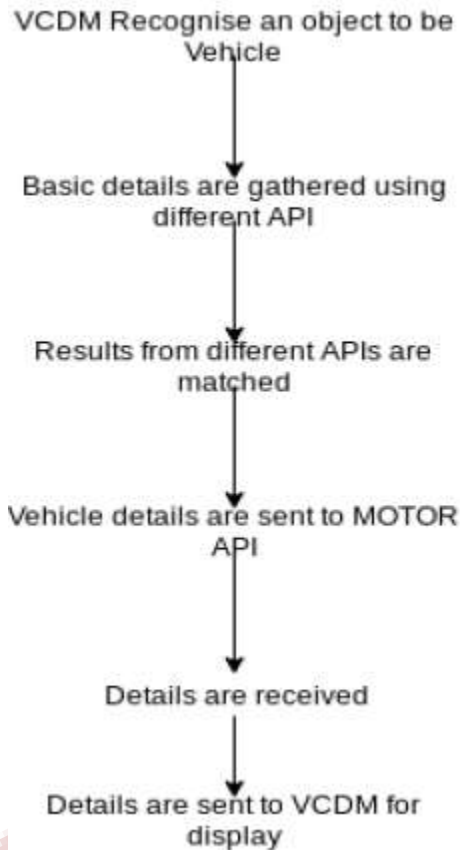
Fig 3: Flowchart for gathering vehicle details.

VII. EXPECTED PROBLEMS

APIs are very helpful in performing actions and they also decrease workload, however they accept and return data in specific format. The information is to be extracted form it which is not a big problem but as there are lot of API in use, each of them may need special data extraction modules, which can be hectic. Another problem with using API is that they work of different HTTP/S and requires good internet connection. This means it our modules will not run as per expectation where ever internet connection is slow.

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