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The Foodict - An Application for Culinary Enthusiasts

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ABSTRACT: With global exposure and extensive usage of the internet all across the world the one thing which keeps us excited is the vast variety of food. People started exploring many new possibilities, opportunities, travel, and food. The food industry has seen a massive leap in this decade. Most people are familiar with a lot of cuisines and culinary practices but some are still in the wayfinding about them. Not all of them are willing to go far abroad to eat authentic recipes in a particular place but wanted to recreate them at home whereas some people really want to indulge in the same authentic place or the same authentic recipe. This project caters to all the sectors while not necessarily inquiring about the recipe or the name of the dish you peeped onto another table.

KEYWORDS: Augmented reality, Machine Learning, Global positioning system, Geographical Information system, Internet, LiDaR, Artificial Intelligence, 3D Map.

I. INTRODUCTION

“The Foodict “ Application focuses majorly on providing the personalized 360-degree view of a food dish, where the User can scan any form of food item through the application and understand all the required information regarding the same. This includes the ingredients used specifying the quantity in that particular scanned item and the size and shapes of the ingredients for utmost authenticity. Alternative Suggestions of Ingredients are provided according to your previous search. The machine learning helps in understanding your likes and dislikes towards your food journey and also suggests some of the most authentic food nearby. Augmented reality is used to look through the food item in a new dimension where minuscule detail of it is not to be missed, Since Replicating the authentic recipe is the primary goal.

II. MAJOR OBJECTIVES

1. Providing overall experience of food.
2. Understanding the technique and procedures involved in culinary.
3. Understanding mechanism and usage of machinery and kitchenware all around the world.
4. Creating a social community for like minded people and discussion amongst them regarding all the areas related to culinary.
5. Interaction with experts around the World for you specific problem.

III. RELATED WORK

The concept of scanning an item was first introduced by Google as “ Google goggles “ which was further named as “ Google Lens “. The Database is the crux of the project where it uses Google Assistant to help in scanning the objects such as animals, flowers, objects places, and many more. Amazon is an E-commerce giant and Myntra, a fashion related e-commerce website also used this technology where they specifically focus on the products listed within the website which can match any item scanned. Apparently all these technologies don't specifically help in any sort of culinary experience.

IV. METHODOLOGY

1.Camera: Scanning of a Food item uses the device camera which helps in understanding the required ingredients and procedure. this process stands in need of an extensive database. The scanned food is examined and later relates to the database. For the creation and constant up-gradation of the Database, the very keen observation and probabilities of each and every ingredient globally are sourced and worked on it. Camera usually differs from device to device where it

uses the Digital image Processing to understand the image with the concerned conditions of light and blur and understanding it to the full potential where the image is further sent to the database. Correction of the image is also a major breakthrough in digital Image Processing, through which it automatically corrects the light and blur conditions using the algorithm.

2. **Database:** Database is Created using the Structured Query Language (SQL). SQL is used in communication with the database. The SQL can be mentioned as the Standard language for relational database management systems. Tasks or statements are given to perform any activity related to database. The standard commands such as “ Update”,

“Insert”, “Copy”, “Drop” and “Delete”. these can be used to complete almost any and every task related to the database which is the mind of the project.

3. **GPS:** Usage of Global Positioning System (GPS) is majorly done for the location of the device through which a Scanning has been performed which automatically updates the database marking the location for further usage and also for personalized suggestions of Food and Culinary practices nearby. Data is the core and emphasis of Geographical Information System (GIS).The operations such as information storage, management, inquiry, analysis, and description all depends on data. Since GPS provides a three-dimensional position, velocity and time about any point on the earth with high precision, it has become a major important resource of the data base. GPS is used from the device where the application is installed in, which helps in more user-friendly customized experience.

4. **Augmented Reality:** In the process of blending interactive digital elements with real-world environment details, Augmented reality plays an important role. Camera and Sensors are the key parts of AR. Using the camera it scans the item in front of them, physically locating it and measuring the objects and enhances with 3D models of AR. Depending on the advancement of smartphones it has a lot of potential in widening the spectrum. AR works on many factors including location-based by using GPS, where each and every location and every different food item is scanned and displayed differently and in a unique manner.

5. **Internet:** The major component binding together is the Internet which remains the underlying power of all the components. This makes the application working and stay interconnected by functioning with precision. To eliminate small objects, connected component labelling is applied to the resultant image.(c) represents text detection by applying second set of criteria which eliminates all the objects whose area is less than 300 and filled area is less than 500.

V. USAGE OF IMAGE RECOGNITION ACROSS THE INDUSTRIES

Image recognition technologies implement deep learning algorithms that identify objects, places, people, text, and actions in images. Image recognition technology is based on the way human brains recognize images.

Applications for image recognition are spread over a number of use cases. This includes content-based image retrieval and automatic image-tagging. A content-based retrieval system processes image information and stores a representation of the content as a vector. Automatic image tagging labels an image with textual concepts.

To understand image recognition we first need to define a few key concepts:

MACHINE LEARNING (ML)—is a subfield of artificial intelligence (AI) that teach a computer program how to learn from data without human intervention.

DEEP LEARNING — A subfield of machine learning that teaches computer programs to perform tasks with a lower error rate than humans.

Today’s image recognition applies deep learning techniques in the field of computer vision. The most popular algorithms for deep learning for computer vision are called Convolutional Neural Networks (CNN). CNNs are based on an architecture designed to process and understand the data present in high-resolution images.

E-COMMERCE INDUSTRY: Image recognition is used to process, categorize and tag the product images to enable a powerful search engine for images. Consumers often abandon a site because the search result displays irrelevant products. There are solutions that contextualize and improve search results of online shoppers. AI software solutions

automatically tag, organizes and search content by attaching labels to the image or video features. There are even solutions that allow the user to build models to train the algorithm to understand any concept, including logos and non-photographic images.

The goal is to make the search more visually and consumer-centric as possible. Companies are developing apps that help customers with their searches. For example, Pinterest has developed a new feature that allows users to identify any item on any photograph online. The user can ask Pinterest to search for similar items using image recognition technology. Such software can even take clues from social media “likes” and suggest similar items through e-commerce stores.

Image recognition technology can also be used to provide enterprise-level digital asset management systems. These platforms apply image recognition technology to create a label based on the figure in the picture. Automatic image

tagging consists of two steps: image tagging and tag refinement. A deep learning algorithm performs the tasks, labeling the image with logical textual concepts. This technique improves images searchability, both inside the organization system and in search engines.

AUTOMOTIVE INDUSTRY: Image recognition will make cars safer and reliable. The image of a self-driving car has been prevalent in sci-fi movies for the last several decades, but the reality is just starting to catch up. There are currently some prototypes from Ford, Google, Apple, Tesla, and General motors. These companies have invested heavily in the technology for autonomous vehicles so far, with Uber’s self-driving cars valued at \$7.25 billion.

The success of the product is highly dependent on the automation level achieved. These are the five widely-accepted levels:

Driver assistance includes safety features, which have now become mandatory.

Partial automation is about stability control, blind-spot detection, and collision warning, yet keeping the driver fully engaged.

Conditional automation gives the driver a supervisory role while staying ready to take control at all times.

High automation includes self-parking, lane-keeping, and traffic jam assistance.

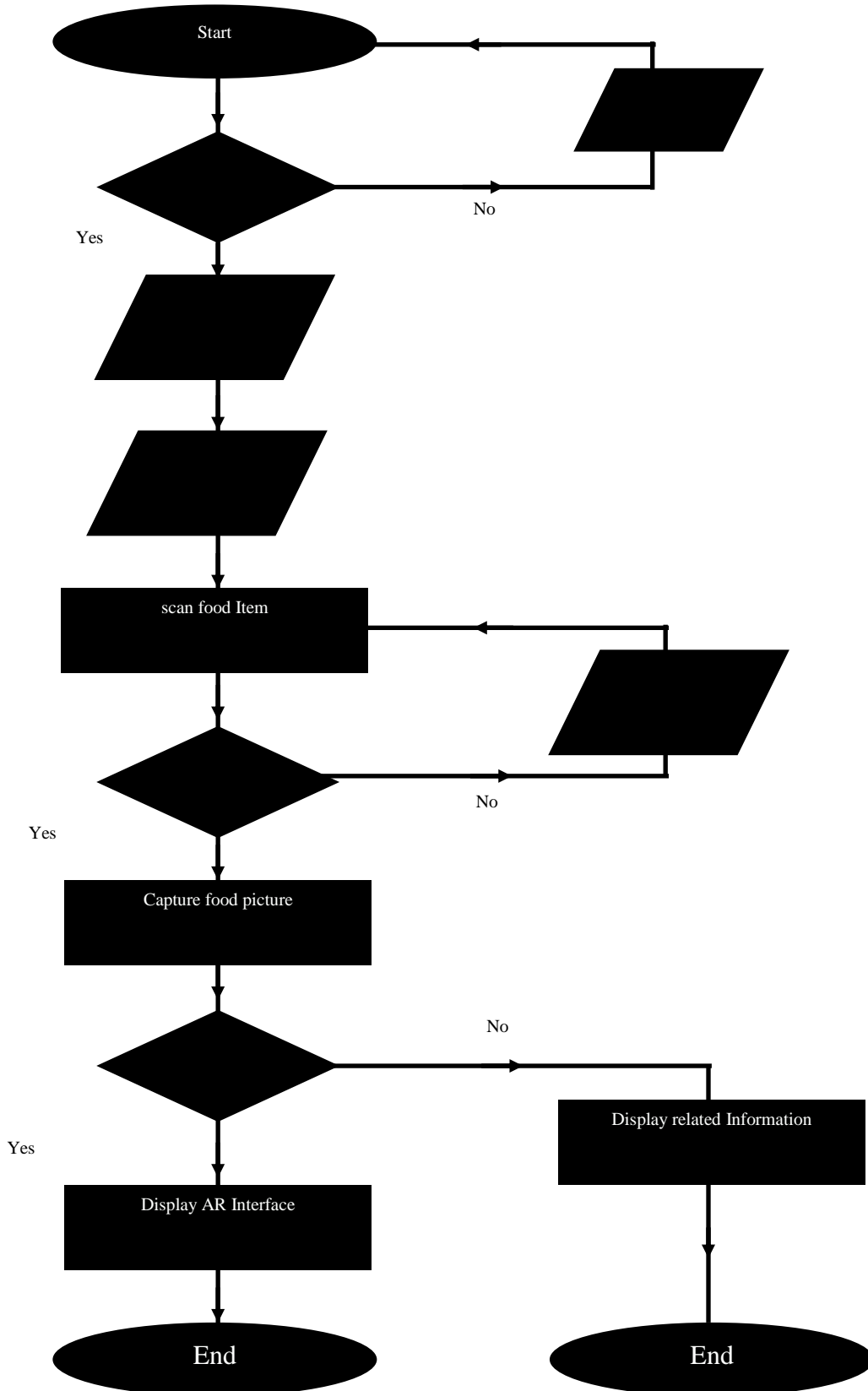
Full automation implies that the driver is no longer present; vehicles communicate with each other on their own.

It follows that the evolution from each step to the next one requires substantial innovations and control systems.

Some of these cars rely on LiDaR (Light Detection and Ranging), a laser-based technology to 3D-map the environment in a similar way to sonars. It can detect Street Furniture, slope changes, objects, and more. However, it has no predictive abilities; It is lagging a bit due to the need for the light to come back to the receiver and the newly created data points to be evaluated.

To solve this problem, Elon Musk suggests focusing more on cameras and AI, an idea also picked up by Apple. This means that there will be more pressure on improving the image recognition aspect of autonomous cars. Facilitating autonomous driving image recognition is used in identifying objects on the road, including moving objects, traffic lights, road signs, vehicles, people, and pathways

VI. FLOW CHART FOR FUNCTIONING OF APPLICATION



VII. ALGORITHM USED IN APPLICATION

Implementation of Camera functionality into the application :

1. The Vision API needs an image to extract the data and a function is added to use the camera APIs to click a picture and use it.
2. A bitmap is used to make an API call.
3. We first create a firebase vision image from the bitmap.
4. An instance of the firebase vision label detector goes through the firebase vision image and finds the appropriate objects in the supplied image.
5. We pass the image to the detect in the image method and the detector labels the image.

VIII. DEVELOPMENT ON ANDROID INTERFACE

“On Device”, API is used for the Development of Application since it is a free , User-friendly API and doesn't involve any paid billing.

Beginning with API a Firewall is needed to kickstart the Project.Relevant dependencies are required for using the API.

A firewall must be added through certain steps in which Android Studio Application is installed.

1. Firebase project must be created.
2. The app must be registered by going into the firebase console.
3. Firebase configuration file must be added. Gradle files should be added to the application file.
4. Fire base SDK is added to the application
5. Analytics are enabled and Java Android is selected.

IX. CONCLUSION

The Application can be the breakthrough of Image recognition technology leading into a completely new sector of the Culinary Industry which further can be the path of the future. The application makes it's way further in upcoming years into fast-moving consumer goods (FMCG) and many other food and beverages related industries. The application not only caters to the food enthusiasts but also for the proven Chefs in the invention of fusion cuisines using the Augmented Reality interface and also the Restaurateurs for their new ventures. Culinary Schools can Use the Application in Studying New Technologies and Mastering the Art of Food.

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