



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijirccce.com](http://www.ijirccce.com)

Vol. 6, Issue 2, February 2018

## Augmented Reality in Restaurant

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**ABSTRACT:** In this paper, we are proposing an Android app based on Augmented Reality, which is going to help restaurants to provide better service to their customers. This app has various new features like real-time tagging, an interactive menu and food identifier. Along with this it will also provide you some extra features like restaurant offers, food item ratings, ingredients information, recipe videos and feedback option.

When you scan the logo or any marker an augmented category will pop up, you have to select the category you want and the items in that category will be in front of you. Now you can swipe to find more 3D dishes on your table through the android device. Then you can select any option like its price, ingredients, and rating given by other users on the side panel of the 3D view. If the user wants to leave any comments about the dish, user can tag any dish available in the restaurant. The user also can tag various images or videos as well as they can give a rating to that dish. So whenever a new user visits that restaurant can find that tags. In this app, a user also can find previous ratings, hot dishes and dishes with the odd name which user can't understand and can be seen in an actual format so that most of the user's problems can be solved.

**KEYWORDS:** Augmented Reality, android device, real-time feeds, tagging, and 3D model.

### I. INTRODUCTION

Today, the excitement of being in restaurant business lies heavily in the constant state of activity. Those who are early adopters of new marketing technologies seem to gain several distinct benefits.

9 out of 10 restaurants fail in their first year.

Is it really a matter of pure luck??

There may not be an immediate return on investments, those who take initiatives to test, learn and experiment new technologies usually end up with a long-term advantage. Among all the modern trends in restaurant marketing, the one which is rapidly growing in popularity is Augmented Reality.

Technology is no doubt one of the best ways how to engage your visitors. The promising technology that can play a vital role in increasing your restaurant sales is augmented reality technology. It allows overlaying digital content in the real world using your own phone, engaging the user and customer more quickly and in a new way.

Augmented Reality as the name suggest it is a live direct or indirect view of a physical, real-world environment whose elements are "augmented" by computer-generated or extracted real-world sensory input such as sound, video, graphics, haptic or GPS data. Just imagine if your visitors could scan your logo with their mobile devices and see the menu the restaurant is offering! Or, they scan a menu and watch the video how the meals are cooked, or see a head chef appearing on a phone screen with a welcome address!

There are endless opportunities that AR can bring. Apart from valuable information about the meals or restaurant itself, AR can really deliver exciting and memorable experiences to its customers. As people always keep on looking for something new, so this technology can become a source of attraction as well as can promote a restaurant in a different manner. Augmented Reality is the integration of digital information with the live video and user environment. By recognizing a visual picture, this technology blends new information and display the virtual result in real time, thereby



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producing extraordinary experiences. Using a mobile application, a mobile phone's camera identifies a marker. By analysing the marker, the software creates a virtual image on the phone's screen. However, due to the number of calculations, only smartphones are capable of supporting augmented reality with success.

## II. LITERATURE SURVEY

A mobile AR systems (MARS) is defined as a system which Papagiannakis et al. [2008]: Combines real and virtual objects in a real environment Runs in real time and mobile mode Registers (aligns) real and virtual objects with each other. The virtual augmentation is based on dynamic, 3-D objects (e.g. interactive, deformable virtual characters) these systems vary in display type, reality, immersion, and directness of interaction.

Since we find various apps and platforms which provide augmented reality features to user for better interaction. Below some of them are listed:

- **Domino's pizza hero (An iPad app)**  
Allows users to make virtual pizzas.
- **Yeppar (An android App)**  
Users can see the food items before they order. It can play advertisement video.
- **Kabaq (Web Based System)**  
Allows customer to view all the dishes on your menu. Inform about portion size and ingredients. Provides an exceptional up-sell opportunity by showing main dishes served along with drinks, side dishes and dessert combinations.
- **Taggar (An android App)**  
Scan any square image or object to see what's been tagged. Tag-over with your own videos, photos, graffiti or stickers. Share with your friends and followers across your social networks.
- **Layar (AR Browser)**  
Layar is an AR browser developed by a Dutch company. The AR view in a layer is based on the metaphor of an extra layer of data. Both user-provided as sponsored layers are available. Sponsored layers might appear higher in the list of suggested or popular layers. Layar also includes a store in which users can buy access to a layer with information.
- **Junaio (AR Browser)**  
Junaio is a mobile augmented reality browser that is focused on interactivity. It can provide live context-relevant information, such as traffic information and the location of the nearest train station and arrival times. Users are able to give recommendations on shops and restaurants and are able to leave digital tags.

## CURRENT ISSUES IN RESTAURANT

- Since we order same dishes on every visit due to lack of knowledge.
- People know local dishes but ignorant of regional dishes.
- People never get to know speciality of a particular restaurant.
- Lack of understanding about different names of the same dish e.g.: okra=ladyfinger.
- Also many restaurants fail to adopt new technologies in marketing.

## III. FEATURES OF PROPOSED SYSTEM

- *Augmented 3D view of Food items:*  
Designing an app which provides category wise menus is planned. You just hold the app on the menu, select the category you want and the items in that category will be popped. Then select any item from the list as per choice and can feel how it looks as this app gives 3d view of the item selected. Details of the dish like its price, ingredients, rating given by other users on the side panel of the 3d view will also be given.

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- **Food Identifier:**

If the user wants to leave any comments about the dish, they can tag each dish available in restaurant. User can tag various images or videos and comments as well as they can give rating to that dish. So whenever new user visits that restaurant can find that tags after keeping camera on menu card. The system uses Inception V3 model. Inception V3 has a first-choice accuracy of 78% on ImageNet, but is the model is 85MB, and requires more processing. It is optimized for accuracy.

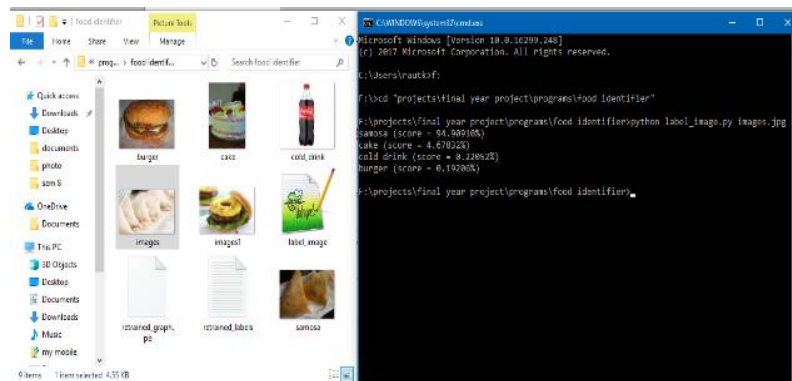


Fig. 1 Food Identifier Output

Fig. 1 shows output of food identifier program which predict the correct food item based on input image using machine learning model.

- **I am feeling Lucky:**

In this feature noise intensity, temperature, weather and date & time these four attributes will be taken in consideration. Based on these attributes, the app will suggest a food item.



Fig 2. Local Data required for food suggestions

Fig. 2 show all the relative data accepted from system to predict the food items as per current environmental conditions.

- **Tagging:**

This feature allows customers to tag their interactive experience in real time; also the other customer visiting the restaurant can have an idea about all the reviews and feedbacks about each dish. The user can tag any item with

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images, videos, graphics, text, etc. Through this, the other customers visiting the restaurant can access all the tags created by previous visitors.

- **Waiting Time Calculation:**

In this feature, users can view their approximate order time. The inputs taken are:

- Type of food ordered- whether starter, soup, etc.
- Category of food, whether vegetarian or non-vegetarian food ordered quantity of food ordered.
- Number of previous orders pending to be served.

Based on these inputs, the algorithm will predict the waiting time for the customer.

## IV. PROPOSED METHODOLOGY

The user visits the restaurant, he is provided with a tablet to scan the image to access the menu, after scanning the image a 3d model is popped, for this to happen we can use AR frameworks like vuforia package in unity 3d to display the model virtually in android application, the user is also provided with rotating or swiping the model. If the user is unaware of the food he can tag the food item so that he can get a description of the new or unknown food.

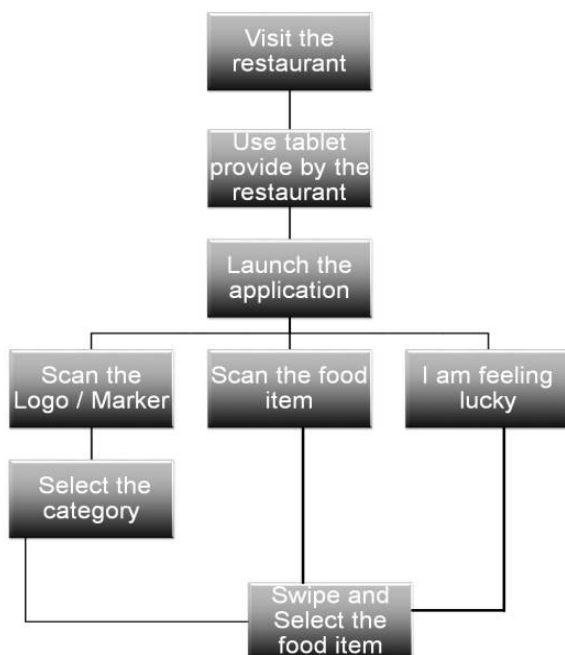


Fig 3. Flow of Proposed System



Fig 4. Menu Selection after food item selected

In Above Fig. 3 flow diagram shows procedure to use application in restaurant. Where after visiting restaurant and start using the application user has provided with various options to select. After selection of food items user will have 3d food item on his desk with various menu options as shown in fig. 4.

When the food arrives at user table he can tag the food item and provide reviews on it, for identifying we have used food identifier algorithm which identifies an object as a food item.

The system will fetch the GPS location. Based on this, the system gets the latitude and longitude of the restaurant location. The weather and temperature at this location can be obtained. Similarly, date and time of that day can be fetched from which the system decides the season. Based on weather, temperature, season parameters and data collected from database, the system predicts the most suitable food item for the user.

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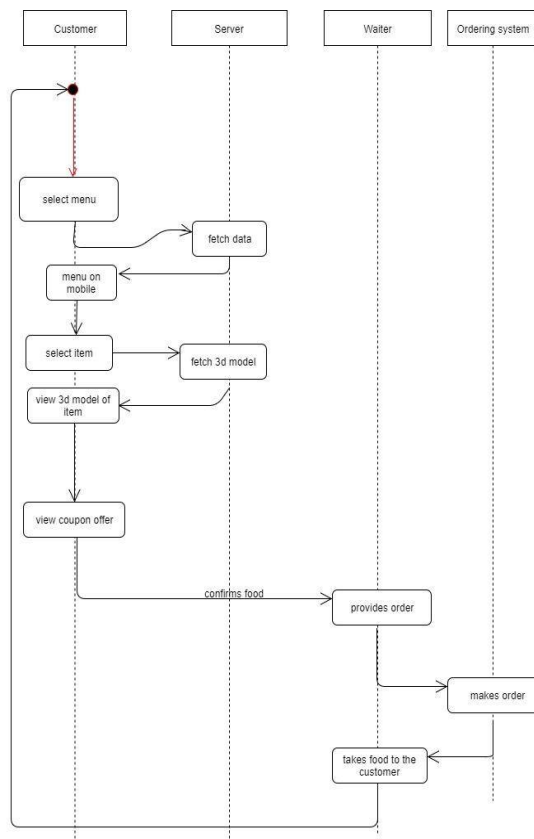


Fig 5. Interaction Diagram of Proposed System

Fig. 5 shows the interaction diagram with complete flow of placing the order in restaurant.

## V. CONCLUSION

The main objective is to build and implement a successful application for a restaurant where the user can easily see the food in the 3-D model before ordering. User can find the restaurant popularity on the basis of real-time feeds. User can comment about the dish by tagging it. Depending upon the current scenario the restaurants are lacking in the presentation of the food which eventually affects their revenue, doing so the restaurants can have a better impact on customers and can increase their growth. This app is also helping in removing all the language barriers and odd names of dishes problem.

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ISSN(Online): 2320-9801  
ISSN (Print) : 2320-9798

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