

Android Based Image Processor For Blind

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Abstract— This Paper 'The Android Based Image Processor For Blind' is developed to make the daily routine of blind people better. It is a camera based application which scans the objects present in the image and gets the information about the objects which can be reflected as a voice message. This is extremely helpful for discovering the items before the visually impaired individuals. So as to utilize this application, all that the client needs to do is simply capture the picture before him in the cell phone which at that point settles the items present in the picture. In this way, this application truly helps dazzle and outwardly hindered individuals by making their work of recognizing objects simple.

I. INTRODUCTION

The aim of our project is to detect and to identify the objects similar to that of a human. Blind Vision detects everything around the person, with the information of depth, collision detection, speech alerts. Blind Vision also features the face recognition, system face training, face recollection and recognition alerts. It guides the blind person move in environment like shopping malls, traffic roads, railway station, hospitals, etc.

Profound learning makes computational models which are made out of different handling layers. These techniques have improved the cutting edge in discourse acknowledgment, visual article acknowledgment, object identification and numerous different spaces. Profound learning finds complex structure in huge informational collections which utilizes back proliferation calculation. It demonstrates how a machine should change its inward parameters that are utilized to figure the portrayal in each layer from the portrayal in the past layer. Profound convolution procedure can be utilized in handling pictures, video, discourse and sound, though repetitive nets utilizes consecutive information, for example, content and discourse.

Microsoft Cognitive Services are collection of machine learning algorithm which helps in solving various problems in the field of artificial intelligence, like language processing, machine learning search, computer vision etc. Basically Cognitive Services are collection of APIs, SDKs and services designed for developers. These services can make the applications more intelligent and more interactive. The aim of these services is to supply interesting and well-off computing experience. The available APIs of Microsoft Cognitive Services are Language API, Vision API, Speech API, Knowledge API, etc. Each API performs different functions such as language API identifies and discovers the requirements of the user, vision API examines the images and videos for useful information,

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speech API helps in identifying the speaker and knowledge API captures research from scientific account. By using these APIs developers can add the intelligent features like understanding face detection, speech detection, vision detection and recognition, emotion detection and video detection. The characteristics which distinguish Microsoft Cognitive Services from other services are multiple face tracking in less time, more accuracy in face recognition, presence of emotions with their types and percentages, better APIs. Microsoft Cognitive Service APIs are used in various fields like enhancing the security, expressing farcical moments, engaging customers via chat, etc.



Fig - 1: Microsoft Cognitive Logo

Cognitive Services are basically a set of machine learning algorithms designed by Microsoft in order to solve the problems in the field of Artificial Intelligence (AI). Cognitive Services provides the best suite for building an automated, interactive model of an application. It helps in constructing and adding powerful intelligence into the applications to allow natural and contextual interactions. Microsoft Cognitive Services allow us to design applications with powerful algorithms using just a few lines of code. Microsoft's aim with these services is to provide more personal and rich computing experiences. Cognitive Services come with a series of APIs and SDKs which are used to allow natural and contextual interaction within the applications that the developer is developing. Microsoft Cognitive Services are of various types and they are grouped under five main categories: language, speech, vision, search and knowledge API. The goal of cognitive services is to balance AI by packaging it into distinct components those are easy to use in the developer's applications. Microsoft Cognitive Services are more related with expansion of Microsoft machine learning APIs, which can be used by developers for adding rich and intelligent features in their applications like video detection, face detection, speech, vision recognition, identifying and understanding emotions of the users and language understanding. These services mainly target on duplicating a desired behaviour that a particular application demands without the restraints of cognitive plausibility.

II. LITERATURE SURVEY

2.1 EXISTING SYSTEM:

- A mobile application is already developed to solve the problems of blind
- But it's not working as expected in an interactive way
- The existing system needs some extra hardware to collect the surroundings data

2.2 PROPOSED SYSTEM:

- The principle point of our undertaking is to make an application that perceives every one of the objects present in the picture.
- These images are captured by the blind people using any android device.
- It is also able to capture the facial expressions of humans present in the image
- This project is dedicated to those millions of visually impaired people.

III. REQUIREMENT ANALYSIS

3.1 HARDWARE SPECIFICATION:

- This project requires a Windows 7 environment with a minimum ram of 4gb and at least an i3 processor.
- Also an android device is required to act as an emulator.

3.2 SOFTWARE SPECIFICATION:

- We use the tool, Android Studio to develop an android application.
- The knowledge on android, java, xml and json is required for develop this project.
- Firebase is used for storage purpose.

3.3 FEASIBILITY STUDY:

The important output required is getting a system which is feasible to our system. This is possible only if the request is processed within a given amount of time, resources and cost. The different feasibilities that can be analyzed are as follows.

- **Operational**
- **Economic**
- **Technical**

Operational Feasibility

It is the type of feasibility that is associated with the development of the project.

All the project progress is analyzed..

Economic Feasibility

Economic Feasibility is an calculation of the economic balance for a project. Based on the study, the system is proved to be economically feasible if the cost required to use application is affordable by the clients.

Technical Feasibility

Technical Feasibility refers to the technical wise functionality according to their constraints in the app.

IV. IMPLEMENTATION

4.1 PROBLEM DEFINITION:

Play store contains many other android applications which try to help the blind. But this application has unique feature which differentiate the functionality in which the visually impaired can access it in easier way. To achieve this objective the following features have been implemented – Describing scene.

Scan or Read Text.

4.2 SYSTEM ARCHITECTURE

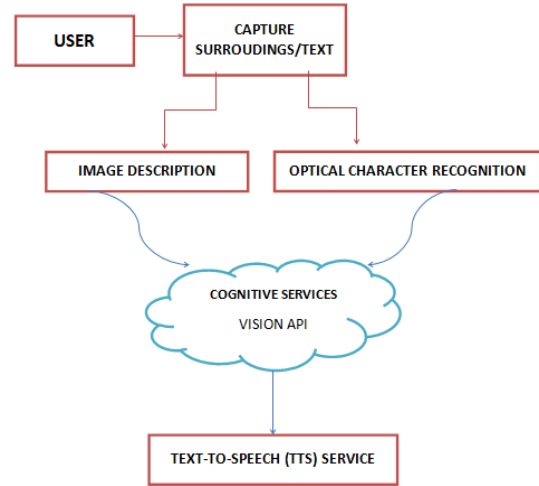


Fig2: System Architecture

4.3 DATA FLOW DIAGRAM

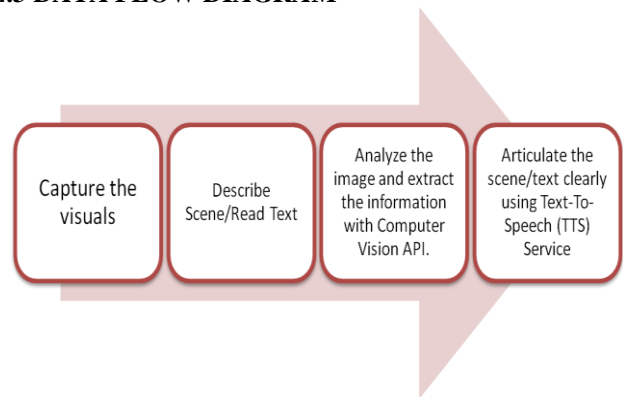


Fig - 3: DFD Diagram

V. SYSTEM DESIGN

This project uses object oriented methodology. Object oriented system refers to a system where each and every aspect is considered as an object. These objects are used to access the classes which contains the implementation details.

This environment allocates tasks among the objects of the applications.

System Design includes three important stages

1. Analysis
2. Design
3. Prototyping and testing.

VI. UML DIAGRAMS

6.1 INTRODUCTION TO UML

The Unified Modeling Language gives the best explanation about the problem statement in any scenario. By drawing these uml diagrams we can understand the scenarios clearly. There are 2 types of models like structural and behavioral.

We are having 11 uml diagrams they are as follows, in our project we have used some of the uml diagrams as mentioned below:

Class diagram:- The class diagram includes operations and attributes.

Use Case diagram:- This has actors and use cases. The actors are the main entities, use cases are the scenarios used in the project.

Sequence diagram:- This diagram divides the modules and get details connected.

Activity diagram:- This diagrams include the activities/entities of the use case.

6.2 USE CASE DIAGRAM

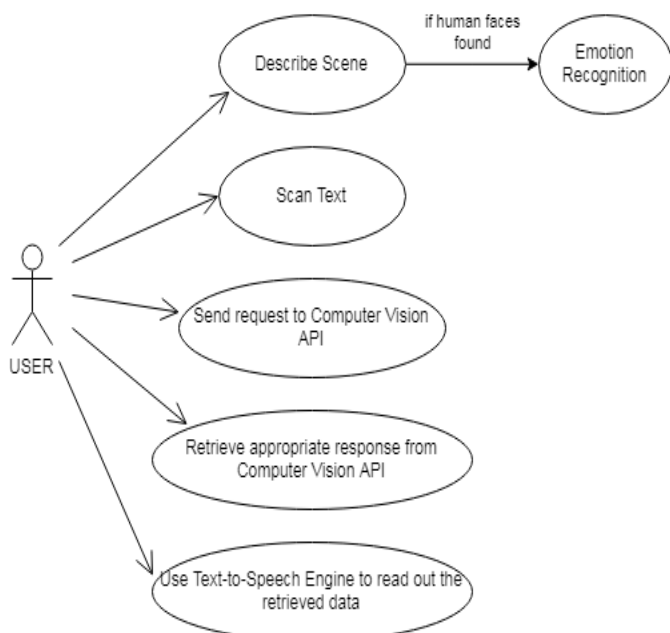


Fig - 4: Use case Diagram

6.3 CLASS DIAGRAM

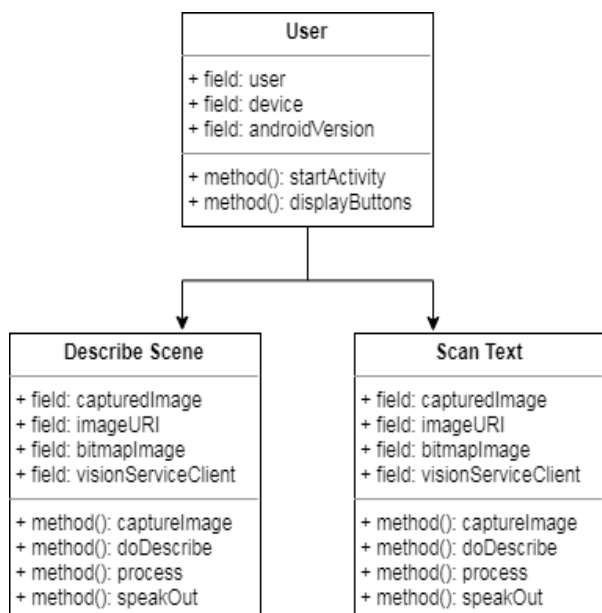


Fig - 5: Class Diagram

6.4 SEQUENCE DIAGRAM

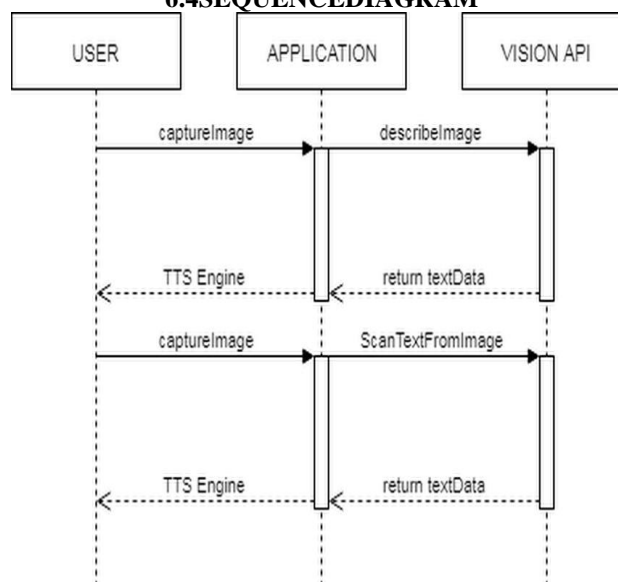


Fig - 6: Sequence Diagram

VII. SYSTEM TESTING

Testing is the major part of the project, we will verify that our application runs properly or not. We will test each and every module in all the positive and negative scenarios. For each and every application the testing part is very important, there are many types of testing, we need to select the test which is suitable for our project.

Unit testing:

In unit testing the module is divided into smaller modules, that smaller module is divided into future more small modules, after the division each and every module will be tested from the bottom to the top. This ensures that every module is correct.

Integration Testing:

The integration testing involves 2 more testing alpha and beta testing's.

For mobile application integration testing is important, we will ensure that all the modules are integrated properly or not.

User Interface Testing:

This testing is done for the front end for an application. This ensures that the UI features are proper or not.

VIII. FUTURE ENHANCEMENTS

8.1 LIMITATIONS

- The user has to be aware with the options in the application, which a blind person can't operate on his own from the first try.
- Depending on the captured image pixel ratio, the results are retrieved.

8.2 FUTURE ENHANCEMENT

- Equipping this application functionality to a wearable device for making it very easy and handy to utilize the Vision API services.

IX. CONCLUSION

In this paper, an android mobile application is powered by Computer Vision API from Microsoft Cognitive Services. Image supplied to API is searched among billions and millions of images to find a similar pattern out of it within seconds. This process is helpful for blind people to know about their surroundings, people emotions, read text which is written in general English. The API requests and responses latency time is decreasing gradually to fraction of seconds. Researchers are working towards it effectively to increase its accuracy even more.

REFERENCES

1. RitendraDatta, Dhiraj Josh, Jia Li and James, Wang, "Image Retrieval : Ideas, Influences and Trends of the New Age".
2. Mr. Manoj K.Vairalkar1 and Mrs.Sonali.Nimborkar.
3. Thomas Deselars, vittorio,"Visual and semantic similarity in Image", IEEE 2010
4. C. Galleguillos, A. Rabinovic,S. Belongie "Object categorization using co-occurrence, location and appearance in Computer Vision and Pattern Recognition".
5. Susmitha Valli G. " Bioinformatics and image processing"Detection of plant diseases " In Advances in Intelligent Systems and Computing , 2019.
6. Divya Jyothi G "Design and implementation of an android application for management of event " IJET (UAE),2018