Writing to Speech Conversion Application With Using an Android-Based Camera to Talk

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ABSTRACT

Talking and listening are the most efficient things for humans to do with each other communicate. Many people have difficulty communicating by speaking which is usually referred to as Speech Impairment. This application aims to make it easier for the deaf or people who have difficulty speak so that you can communicate well and correctly by speaking voice. The process of making this application was made using Android studio, mobile vision API, and Text To Speech. With the conversion application writing to speech using a camera for the Android-based speech impaired can It was concluded that the application could help speech impaired people and people people who have difficulty speaking communicate better and more effectively

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1. INTRODUCTION

Writing to speech conversion involves the process of converting written text into audible sounds. This can be useful in a variety of contexts, including accessibility applications, voice assist systems, or automatic reading of text. This technology is widely used in everyday applications, including virtual assistants, voice-based navigation, audiobooks, and more. Increasing developments in the fields of speech recognition and speech synthesis have brought great benefits to improving accessibility and user experience across various platforms and devices.

The deaf are people who have difficulty speaking communicate by talking. Talking is the most efficient medium for communicate between humans. There are many deaf people who dream of able to communicate well. In the technological developments that occur Today, readers have grown from dream to reality. Optical Character Recognition has become one of the most successful applications in the world the field of pattern recognition and artificial intelligence (Artificial Intelligence). Optical Character Recognition is the process of changing an image or handwriting (numbers, letters, and symbols) that have been transferred by the scanning machine into text format on the computer. Speech synthesis is artificial intelligence based on human way of speaking. Text To Speech synthesis is a system that can read the text provided, whether provided directly by the operator or someone who has scanned and entered from the Optical Character Recognition system..

Optical Character Recognition and Text To Speech on Android devices. On research they were explained about the use of Text To Speech and Optical systems Character Recognition which can recognize letter characters from images which is scanned. But to scan this image they have to take an image via camera or inserting a softcopy file of the image you want to scan. [1]. Previous researchers' applications required users to enter The image is in the form of a soft copy or image taken from a camera. This is what happened The drawback of this research is that it will take up a lot of memory saves the image to be scanned and must retrieve the image to be scanned scanned first before conversion. The author offers a deep solution recognition of letters in images using Mobile Vision. This solution is purposeful to recognize the characters of the letters in the book or paper scanned via camera

directly (real time). Use of Mobile Vision This is expected to make it easier for users to scan and read out words in books or handwriting. [2].

One of the technologies that is quite well known in America in the health sector is Medical Transcriptionist (MT) is a commercial application that uses speech recognition. And until now there are many applications developed using speech recognition, including in the health sector there is MT, in the military sector there is High-performance fighter aircraft, Training air traffic controllers, to tools that help people who have Having difficulty using your hands, a computer was created that could operated using user pronunciation detection. [4].

2. RESEARCH METHODOLOGY

Previous research produced a Text To Speech application using images taken from the camera as a source for the writing to be read. This way becomes less effective because the user has to carry out the retrieval process take a picture first through the camera and of course this will use a card existing storage. [5]. In research on Text To Speech entitled Design and Development of Text To Speech Applications In Indonesian, they still provide a textbox where you can enter the text to be read. Of course this is one of the things that is not effective for The user has to enter the text that will be read aloud. [6].

System modeling is carried out to describe any use cases and actors who will be involved in the analysis of the proposed system. This can be explained in more detail seen in the following table.

Table 1. Requirement Actor & Use Case

Requirement	Actor	Usecase
There is writing in the image which will be read application	Users / Speech Impaired	Detect writing Read the writing

Use Case Diagram explains what the system will do will be built and who will interact with the system. Use Case Diagram can made according to the table above, namely Actor Requirements and Use Cases

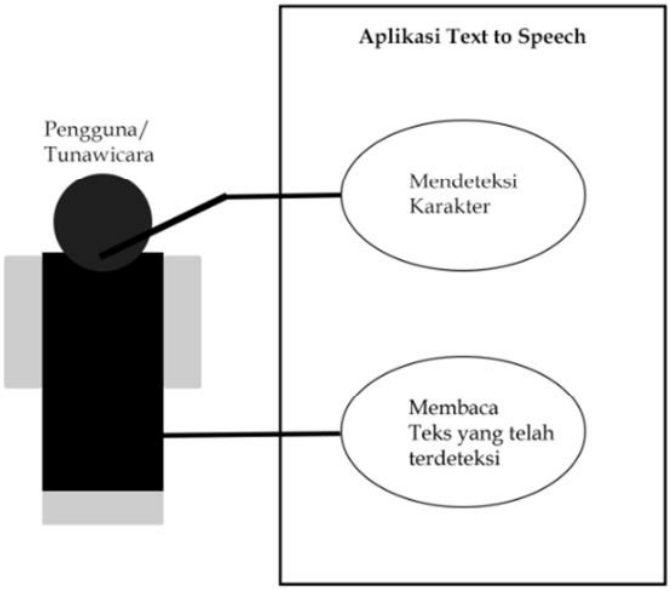

Figure 1. Use Case Converting, Storing and Searching Information

Each use case in the Figure above must be described in a letter is called a flow of events letter. This letter defines what must be done by the system when the actor activates the use case. The structure of a use case letter can vary but generally this description should be at least contains a Brief Description (short description), ,Actors involved ,Preconditions that are important for the use case to start ,A detailed description of the encompassing event flow is included The main flow of events can be further broken down into subflows events and Alternative flow to define exception situations and Postconditions which explain the state of the system after the use case end.

Apart from the things mentioned previously, you can also use several other additional descriptions to complete the description made. After explaining the use case in the previous discussion, the following follows explained the use case specifications that have been determined. Writing to speech conversion has various use cases in various industries and applications. Below are some use case examples that demonstrate the importance of text-to-speech conversion.

This technology is widely used in everyday applications, including virtual assistants, voice-based navigation, audiobooks, and more. Increasing developments in the fields of speech recognition and speech synthesis have brought great benefits to improving accessibility and user experience across various platforms and devices. With the introduction of text-to-speech conversion technology, we can witness expanded accessibility and increased human interaction with technology, enabling various levels of society to access information more efficiently.

3. RESEARCH RESULTS

Use of Mobile Vision as an OCR algorithm for scanning The writing is very accurate and very good to use as a scanner writing because it provides accurate output results in accordance with text scanned from the image. The use of Text To Speech is very helpful in reading desired text. But the accent used is still very far away from logs. Use of applications that use the OCR and Text To system This speech makes it very easy to convert recorded writing via camera directly (real time) and read aloud. this application It is hoped that it can help the deaf in communicating better.

In this section we will discuss the working system of the existing system designed by the author. The display presented is the interface that is run when the application starts. This application system has 2 important parts: doing convert images to text and convert text to sound. Convert images to text using the Mobile Vision API. Android Text To Speech is used to convert writing into sound. Testing to measure the performance of this application's text detection as well using different scenarios. Font size, font and display differences examples are varied to test the effect of application capabilities.

Table 2. Level of text recognition with large, medium and small font sizes.

Font Size	Image	Information
40		The word was detected successfully
20 - 25		The word was detected successfully
10 -15		The word was detected successfully

Font Size	Image	Information
8		The word was detected successfully

Larger fonts have a higher recognition rate compared to medium and small sized fonts. The text is displayed on a computer screen and on a sheet of paper. Application performance is tested through these two different displays. Results From the test using different views we can see in table As expected, the text recognition is displayed on the computer slightly higher than the text on the sheet of paper. This is because Computer screens have higher contrast than paper. On the main page there is a camera display to detect images will be converted directly. Then there is a textbox where the conversion results are has been processed by OCR will appear and will also change directly according to the camera direction indicated by the user.

4. CONCLUSION

Based on the discussion in the previous chapters, in this chapter The author can draw the following conclusions:

1. Use of Mobile Vision as the OCR algorithm for this application increase the level of accuracy of word recognition. But the OCR system it's still a long way to detect complex fonts in depth writing or handwriting accurately.
2. Using Text To Speech, you can read the text Enter it in the textbox correctly and based on the selected accent.
3. The use of this application is also highly recommended for the speech impaired in communicating so that they can also communicate with read out the text they want to say with this application.

Some suggestions from the results of research that have been carried out. Application systems can be designed better, for example applications can detect the language of scanned text automatically and choose the accent according to the scanned language and this application will also be better if the next developer adding regional languages as one of the accents for pronunciation.

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