

Project Proposal

The phone reader

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December 3, 2012

1 Statement of the Problem

The project that we will be working on this year is called *The Phone Reader*. Reading or understanding a text can at times be a challenge if it is written in a foreign language, if the reader is illiterate, or if one has reading disabilities. The solution to this problem is the goal of the Phone Reader project. This latter aims to develop a mobile application that can read a text for the user through a mobile Android device. To use it, the user has to photograph the text with his phone, choose a language for the translation if necessary, and send the photo to the server, which extracts the text in the photo and

produces its speech.

2 History and Background

This research topic has been studied by some scientists a few years ago.

In 2009, Hossein and Hadi Shayesteh, computer science honours students in the University of Western Cape [1], worked on the phone reader project under the supervision of James Connan. They developed the software and it can be integrated in a mobile phone.

Their software is functional but is not complete.

In 2008 [3], a demonstration of the first cell phone that reads to the blind and dyslexic, released by Joint Venture of Kurzweil Technologies and the National Federation of the Blind (USA), was held during a press conference in the Holiday Inn Capitol, Washington DC on the 28 January. The company's reading software has been designed for the Nokia N82 cell phone running on the Symbian operating system with its integrated high-resolution camera. The user takes a picture of a text, and the software reads it for him. Blind people can then clearly hear the text; and those who are not blind, but who have learning disabilities can enlarge, read, track, and highlight the text. The development of this software required character-recognition software, text-to-speech conversion technology and Kurzweil's image processing software.

This software does not include translations of texts, and the Nokia N82 is not easily affordable.

3 Objectives

The Phone Reader is meant to help different type of people unable to read a text. The following list presents cases in which the Phone Reader can be used:

- Blind people can use it when they have a text to read.
- Non-native speakers (like tourists) can use it when they do not understand a text written in a foreign language, or when they are not sure of the right pronunciation of words.
- Illiterate or dyslexic can use it when they have difficulties reading a text.

4 Methodology

The system was programmed using Android [2], which is a Linux-based operating system for mobile devices developed by the Open Handset Alliance. The phone sends requests to the Apache Server by uploading photos to it. The Apache Server processes the client's request by pre-processing the image sent, before extracting its text with an OCR (Optical Character Recognition) program. TTS (Text To Speech) engine produces the speech on the phone after performing a required translation of the extracted text. The programming languages used are Java and PHP.

5 Progression

The following table presents the different steps that need to be accomplished in order to develop the Phone Reader:

Table 1: Progression of the Phone Reader project

Steps	Tasks
Step 1	Review existing technologies
Step 2	Determine system requirements
Step 3	Configure web service
Step 4	Implement and evaluate preprocessing
Step 5	Implement OCR
Step 6	Implement translation
Step 7	Implement user interface/phone client
Step 8	Implement TTS functionality on the phone
Step 9	Testing the system
Step 10	Documentation

References

- [1] HOSSEIN, AND SHAYESTEH, H. The Phone Reader. Online, 2009. Available from: <http://www.cs.uwc.ac.za/~hashayesteh/>.
- [2] SAHA, A. K. A developer's first look at android. *Linux for you* (January 2008), 48–50.

- [3] TECHNOLOGIES, K., AND THE NATIONAL FEDERATION OF THE BLIND.
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Blind* (27 January 2008), 1–3.