Real World Mapping System for Blinds

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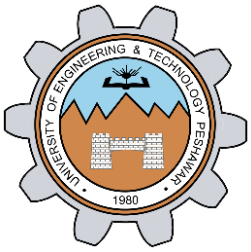

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Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

Certificate of Approval

We approve the project proposal of Shah Raza, Hudabia Faiz, and Muzamal Ali titled "Real world Mapping System for Blinds" submitted to Department of Computer Systems Engineering, UET Peshawar in partial fulfillment of requirement for the degree of B.Sc. (CSE).

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Real World Mapping System for Blinds

Introduction

From reading a book to walking down the street, blind persons face numerous hurdles in their daily lives. Many tools exist to assist people in dealing with their problems, yet they are insufficient. Vision is the most important thing a human may have, and it plays a crucial role in a person's life whether or not they can see. The life of a blind person is difficult because they can't analyze the situation like how a normal person does. Our Project is used to assist blind and visually impaired persons with emotion recognition and reading of a documented text in photos.

We provide a facial recognition approach based on Convolutional Neural Networks (CNN). The data that goes into our system for facial expression recognition is an image. Following that, we use CNN to predict the facial expression label, which should be one of the following: anger, disgust, fear, happiness, neutral, sadness, or surprise. We will try to find a method for extracting text from photographs, processing this text Digitally, and finally translating the text into audio output. Our goal is to improve the ability of blind people. Offering a solution for them to feed the information in the form of a voice message to them.

Problem Statement

Visually impaired people encounter challenges and are at a disadvantage as visual information is what they lack the most. The visually handicapped can be helped with the use of innovative technologies. The concept is to make an Android mobile app that includes features such as voice assistant, image recognition, currency recognition, and e-book, etc. The software can recognize items in the environment using voice commands and do text analysis to recognize text in a hard copy document.

Motivation of the Project

Following are the motivational factors behind this project:

1. In 2015, there were an estimated 253 million people with visual impairment worldwide. Of these, 36 million were blind and a further 217 million had moderate to severe visual impairment (MSVI). The prevalence of people that have distance visual impairment is 3.44%, of whom 0.49% are blind and 2.95% have MSVI. These people need to be provided with a system that can make their lives easier.
2. In Pakistan, an average person cannot afford to have the luxury of high-tech expensive resources to help with their visual problems. We aim to develop a system that is very easy to access and much more affordable.

Objectives

Following are the objectives of this project:

1. To gain further knowledge about visual impairment and how can we help to improve their experience.
2. To learn and understand different ML algorithms to be used in the design & deployment of "Real World Mapping System for Blinds".
3. To design a cost-effective, optimized, scalable, highly-available, and secure solution using the most accurate ML algorithm.
4. To implement and deploy the proposed solution.
5. Test the deployed product and report the findings.

Methodology

Following are the steps of our methodology:

- **Background Study**

In background study, we will gain further knowledge about working principles of Object Detection, Speech Recognition, OCR, Image Classification, and CNN. We'll review existing solutions such as Seeing AI, Envision, Lookout by Google, and Aipoly Vision. The output of this step will be a detailed knowledge and cost analysis of existing solutions.

- **Literature Review**

In literature review, we will identify, select, and understand the suitable Machine Learning algorithms for the tasks we aim to include in our project. We'll also study and review related research papers to better our understanding. The output of this step will be a proposed architecture Real World Mapping System for Blinds.

- **Implementation, Results, and Report**

In this step, we'll implement and deploy the proposed architecture. We'll perform various tests on deployed solution to check it for high-availability, optimization, and cost-effectiveness. After the collection of results, we'll report our finding. The output of this is the implemented, tested deployed solution with comprehensive report.

Gantt Chart

Work/Schedule Plan	**Nov-Dec 2021**	**Jan-Mar 2022**	**Mar-Apr 2022**	**Apr-May 2022**	**May-Jun 2022**	**Jun-July 2022**
Background Study						
Literature Review						
Implementation						
Results						
Thesis writing						

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