Department of Electrical and Computer Engineering

North South University

Senior Design Project

Blind Person Assistant - Object detection With Voice Feedback

Mosarrat Shazia Kabir	**1831228042**
Syeda Karishma Naaz	**1831270642**
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Faculty Advisor:

Md. Shahriar Hussain

Senior Lecturer

ECE Department

Fall 2022

DLETTER OF TRANSMITAL

February, 2023

To

Dr. Rajesh Palit

Chairman,

Department of Electrical and Computer Engineering

North South University, Dhaka

Subject: Submission of Capstone Project Report on **"Blind Person Assistant - Object detection With Voice Feedback."**

Dear Sir,

With due respect, we would like to submit our **Capstone Project Report** on "Blind Person Assistant - Object detection With Voice Feedback" as a part of our BSc program. This project was very much valuable to us as it helped us gain experience from practical field and apply in real life. We tried to the maximum competence to meet all the dimensions required from this report.

We will be highly obliged if you kindly receive this report and provide your valuable judgment. It would be our immense pleasure if you find this report useful and informative to have an apparent perspective on the issue.

Sincerely Yours,

.....
Mosarrat Shazia Kabir
ECE Department
North South University, Bangladesh

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Syeda Karishma Naaz
ECE Department
North South University, Bangladesh

.....
Simon Uddin
ECE Department
North South University, Bangladesh

.....
Sanjida Akter
ECE Department
North South University, Bangladesh

APPROVAL

Mosarrat Shazia Kabir (Student ID: 1831228042), Syeda Karishma Naaz (Student ID: 1831270642), Simon Uddin (Student ID: 1831858642), Sanjida Akter (1831522042) from Electrical and Computer Engineering Department of North South University, have worked on the Senior Design Project titled "Blind Person Assistance: Object Detection with Voice Feedback" under the supervision of Md. Shahriar Hussain partial fulfillment of the requirement for the degree of Bachelors of Science in Engineering and has been accepted as satisfactory.

Supervisor's Signature

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Md. Shahriar Hussain

Senior Lecturer

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Chairman's Signature

…….

Dr. Rajesh Palit

Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

DECLARATION

This is to certify that this Project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. Any material reproduced in this project has been properly acknowledged.

Students' names & Signatures

1. Mosarrat Shazia Kabir

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2. Syeda Karishma Naaz

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3. Simon Uddin

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4. Sanjida Akter

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ACKNOWLEDGEMENTS

We would like to express our special Thanks of gratitude to Md. Shahriar Hussain (HSM) Sir who gave us the opportunity to do the wonderful project on the Senior Design Project I and II (CSE499A and B), which also helped us in Research and we came to know about so many new things. We are really thankful for him. It is his guidance and patience that led us to envision our project "BLIND PERSON ASSISTANT: OBJECT DETECTION WITH VOICE FEEDBACK" to be a full-fledged solution for a blind people.

ABSTRACT

This project was specially implemented to help visually impaired people. The project can detect different objects in real time, counts them, and delivers voice feedback. Since our project is an object detection system, the first thing we needed was a proper dataset. For this project, we used two datasets. One is from the Microsoft COCO object detection dataset, and another is from the Kaggle object detection dataset. However, the Kaggle dataset was not preprocessed. Therefore, we had to resize the image, and along with that, we had to make all the images in the same color format. To process the images, we used "OpenCV" as an image processing tool. Next, we moved to set the algorithm to train and test our system. We chose to use two commonly used algorithms. One is the SSD Mobilenet algorithm, and the other is the YOLO Algorithm. In our project, we used SSD Mobilenet v2, YOLO v4, and YOLO v7, which are one of the fastest and most accurate object detectors. The accuracy we got for SSD Mobilenet v2, YOLO v4, and YOLO v7 was 94%, 94%, and 98%. Among the three models, YOLO v7 had the highest accuracy. Therefore we chose YOLO v7 for further work. Then we implemented GTTS (Google Text To Speech) and a counting function that counts the object classes. Eventually, the system counts the objects in real-time detection, and with the help of GTTS, it returns voice feedback.