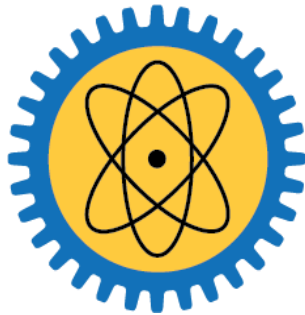




**BUSITEMA  
UNIVERSITY**  
*Pursuing excellence*

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

**DESIGN AND IMPLEMENTATION OF SMART GLASS THAT PROVIDES  
REAL-TIME OBSTACLE DETECTION, RECOGNITION AND AUDIO  
FEEDBACK.**

**By**

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**(BU/UG/2021/3396)**

**SUPERVISORS**

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*This Final Year Project Report is submitted to the Department of Electrical and Electronics Engineering in partial fulfillment of the requirement for the award of the degree of Bachelor of Science in Electrical Engineering of Busitema University*

**MAY 2025**

## **ABSTRACT**

The Smart Glasses with Blind Assistance System: Real-Time Object Detection with Voice Alerts is an innovative technology designed to empower individuals with visual impairments. This system, developed using Python, combines real-time object detection and audio feedback to assist users in navigating their surroundings independently and safely. Beyond navigation, it can also function as an alarm alert system, providing auditory cues upon detecting objects. The technology's potential extends to becoming a hardware product for biomedical applications. Ongoing research aims to enhance accuracy through model retraining and implementation distance calculations for detected objects.

Additionally, plans include deploying the system on hardware devices like smart glasses and expanding accessibility through a dedicated mobile app. This smart glasses-based solution holds great promise in improving the quality of life and independence for visually impaired individuals.

**DECLARATION.**

I ODEKE IVAN declare that this final year project report was prepared out of my efforts and has never been presented to any institution of higher learning.

ODEKE IVAN

BU/UG/2021/3396

Signature.....

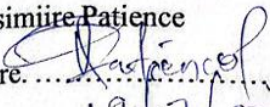
Date ..... 12<sup>th</sup> 107 / 2025

## APPROVAL

This Final Year Project Report Was Prepared and Compiled by Odeke Ivan. It Is Therefore Submitted to Be Approved By;

Supervisors

Ms. Tusimire Patience

Signature. ....  .....

Date. .... 19/07/2025 .....

## **DEDICATION**

I pay tribute to my precious family for their unfaltering encouragement, prayer, and support in the course of my academic pursuit. Particular appreciation also extends to my parents whose love and sacrifices have served as my main pillar of fortitude and inspiration.

## **Acknowledgement**

Above all else, I express my gratitude to the almighty God for the gift of life and wisdom and the ability to fulfill this work. I extend my sincerest appreciation to my supervisor Ms. Tusimiire Patience and my project partner Isabirye Aziz For their guidance, mentorship, and motivation during the duration of this study. I also offer sincere gratitude to my colleagues and lecturers in Busitema University for their academic guidance and enriching discussions that served in the shaping of this work. Finally, I express my appreciation to my family and my friends for their love, tolerance, and strong belief in me.

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## ABREVIATION

YOLO - You Only Look Once

OCR - Optical Character Recognition gTTS

- Google Text-to-Speech

CNN - Convolutional Neural Network

BODPM - Binary Object Detection Pattern Model

GPRS - General Packet Radio Service

GPS - Global Positioning System

MP3 - MPEG Audio layer 3

NMS - Non-Maximum Suppression

FPN - Feature Pyramid Network

CSP - Cross Stage Partial Network

ARM - Advanced RISC Machine

GPIO - General Purpose Input/Output

BMP - Bitmap

SDHC - Secure Digital High Capacity

CLI - Command Line Interface

SSH - Secure Shell

NLP - Natural Language Processing