THE IMPLEMENTATION OF HAND GESTURE METHOD SIGN LUGGAGE BAG FOLLOWING SYSTEM USING ARDUINO

NUR ZULYENA BINTI MOHD NOR KAMAR ARIFF

BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY

(Industrial Automation & Robotics) WITH HONOURS

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NUR ZULYENA BINTI MOHD NOR KAMAR ARIFF

A thesis submitted
in fulfillment of the requirements for the degree of
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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Automation and Robotics) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Projek ini dicadangkan mengenai pelaksanaan kaedah isyarat tangan menandakan beg bagasi sistem mengikuti menggunakan Arduino. Idea untuk mengembangkan prototaip ini adalah kerana mempunyai masalah kesihatan, ibu menangani anak-anak mereka dan orang lain yang dapat berhubungan. Beberapa masalah untuk menanggani adalah satu-satunya jalan penyelesaian yang memudahkan pelancong untuk membawa barang-barang mereka. Oleh itu, sistem beg bagasi dibangunkan dengan menggunakan Arduino untuk mengikuti pengguna. Untuk mengawal pergerakan bagasi, digunakan kaedah isyarat isyarat tangan dan tinjau prestasi kaedah yang dicadangkan untuk beg bagasi yang mengikuti sistem. Aliran kaedah untuk merancang berdasarkan fasa pengembangan prototaip kemudian dilanjutkan ke bagian analisis. Dengan menggerakkan dan mengawal beg bagasi menggunakan kaedah tanda tangan dan kod warna, projek ini dirancang untuk membuat pergerakan beg bagasi lebih lancar.Menggerakkan dan mengendalikan beg bagasi menggunakan kaedah tanda tangan dan kod warna, projek ini dirancang untuk menjadikan pergerakan beg bagasi lebih lancar. Dua gerakan tanda menentukan tanda isyarat untuk MULA dan BERHENTI tanda arahan untuk beg bagasi mengikuti sistem, dan dikendalikan oleh sarung tangan. Oleh itu, komunikasi tuan dan hamba menghantar maklumat dari kaedah tanda isyarat tangan sarung tangan untuk memberi arahan. Secara keseluruhan, fungsi keseluruhan peranti telah diuji secara meluas, dan dikatakan berjaya beroperasi.

ABSTRACT

This project proposed on the implementation of hand gesture method signs luggage bag following system using Arduino. The idea to develop this prototype is because of health problem, mother handled their kids and others that can relate. These few problems to travel around are the one solution that makes it easier for the traveller to travel carry their luggage. Hence, the luggage bag following system was developed by using Arduino to follow the user. In order to control the movement of the luggage, hand gesture sign method is applied and review the proposed method's performance for the luggage bag following system. The flow for method to design is based on the phase developed the prototype then proceed to part of analysis. By moving and controlling the luggage bag using a hand gesture sign method and color code of tag, this project was designed to make the luggage bag movement smoother. Two sign movements specified the gesture sign to START and STOP command sign for the luggage bag following system and controlled by glove. Thus, the master and slave communication transmit information from the glove hand gesture sign method to give a command. Overall, the whole device's functionality has been extensively tested, and it is said to operate successfully.

DEDICATION

This report is dedicated to my beloved parents and family member, thank you for showering me with your continuous love and devotion. It will always be remembered and kept in my heart. They always support me through thick and thin throughout the process of completing this report. Next, to my Supervisor and Co-supervisor, thank you for all the knowledge and support. Your patience, support and words of encouragement gave me enormous strength throughout the whole project. Then, to my seniors, my bestfriends and fellow friends, thank you for offering guidance and directions when I am at also lost the advice, support and motivations for the start of this project until the end of the project.

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GPS	Global Positioning System
RFID	Radio Frequency Identification
PID	Proportional Integral Derivative
DC	Direct Current
RPM	Revolution Per Minute
Nm	Nanometer
KG	Kilogram
CM	Centimeter
m	Meter
m/s	Meter per second
LED	Light Emitting Diode
USB	Universal Serial Bus
RxD	Receiving Data
TxD	Transmitter Data

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter presents the implementation of hand gesture method sign luggage bag following system using Arduino with the subject matter and the problems to be studied, the objective and the project scope. The problem statement is about the faced traveller issues while the goal is the objective or intent that helped the project grow. There will, however, be limitations in the implementation of this project which will be discussed in this chapter.

1.2 Background

The technological advancement of various operating equipment control systems in the automation sector has been achieved by multiple means, including mechanical, hydraulic, pneumatic, electrical, electronic and computer systems, usually in combination. Such methods are usually used by complex processes, such as modern industrial plants, aircraft and ships together.

(Ryumin et al., 2019) stated that, automation introduces machines to human tasks once performed, otherwise hard jobs. According to (Yen Leng Ng, 2015), robot technology had advanced considerably. For industrial applications, most traditional robots are still used, such as in automobile assembly stations. Meanwhile, in everyday applications, smart robots have become popular. This defines the architecture for devices for hardware and software for the automated implementation of the following framework for carrying luggage bag.

Based on the following system implemented luggage is automation, robotics that keeps track of the owner all the time. For the Pixy camera, it acts to track the hand movement of the owner, sign methods and to follow the owner through a walk and trip as the 'eyes' of the luggage. Arduino Broad is the key part of the system, as it receives data on the position of the tracked object from the Pixy CMU. The movement of the DC motor can then be regulated according to Arduino's evolution. Pixy CMU itself controls the DC motors directly.

This luggage can be used manually, or auto-mode can be selected from a user, and a few obstacles can be sensed with an ultrasonic sensor, which can sense and remain away from the views of another traveller when driving on the airport. Others, digital lighting is one of the features of this luggage and indicates the luggage bag battery level. Anti-theft warning with a buzzer is the defence against luggage loss, which we can track and locate.

At the airport, passengers must take the luggage bag and carry it there from the car to the airport check-in desk. The objective of implementing a system-based luggage bag would ease the burden and helped to solve the problems, including labour savings, energy costs savings, material costs savings and improvements in quality and accuracy. This is because the implementation of hand gesture method sign luggage bag following system using Arduino is helpful for all people that want to travel, and it has become easier than other luggage.

1.3 Problem Statement

Travelling is very popular nowadays. All traveller can move everywhere and anywhere they want to go. As the traveller, we know that there have a few problems to travel

around or hold a passport, carry-on luggage or baggage, and backpack while walking. Others, we know that if a few travellers there have a physical health problem using a wheelchair or walking stick that can help them move. Furthermore, it can also be difficult for a mother who is bringing their kids while carrying the luggage, and it is the challenging situation to manage their child and kids with their others stuff when arrived at the airport and during travel. So, from the idea and innovation of the luggage bag, this implementation of the hand gesture sign method luggage bag following system is the one solution that makes it easier for the traveller to travel carry their luggage. Some features prevent losing, stolen such as crime purpose their luggage. So, from this current issue, the implementation of hand gesture method sign luggage bag following system using Arduino can help and make it easy for a traveller to travel with the novelty of this project following system automation.

1.4 Objectives

The aims of this research were mainly focused on developing the luggage bag following system:

1. To develop an automated luggage bag following prototype using Arduino.
2. To design the hand gesture controlling system for the following purpose.
3. To analyze the performance of the proposed method for luggage bag following system.

1.5 Scope

This project aims to enhance the implementation of hand gesture method sign using a flex sensor as a command for luggage bag following system. It is also using the Arduino Uno microcontroller board. These innovations will improve the use of luggage bags and