BABY STROLLER MOVEMENT CONTROL BY ANDROID APPLICATION

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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BABY STROLLER MOVEMENT CONTROL BY ANDROID APPLICATION

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor's Degree in Electronics Engineering Technology (Telecommunications) with Honours

by

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TAJUK: **Baby Stroller Movement Control by Android Application**

SESI PENGAJIAN: **2014/15 Semester 1**

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the Bachelor's Degree in Electronics Engineering Technology (Telecommunications) with Honours. The member of the supervisory is as follow:

……

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ABSTRAK

Secara umumnya, projek ini adalah bertujuan untuk mereka bentuk sistem dengan menggunakan gabungan perisian dan perkakasan yang mempunyai keupayaan untuk mengawal dan mengendalikan pergerakan kereta sorong bayi tanpa wayar dengan menggunakan teknologi Android dan Bluetooth. Melalui projek ini, pengetahuan dalam mereka bentuk dan penggunaan bahasa pengaturcaraan dalam Arduino untuk tujuan pegantaramukaan dapat dipelajari dan dipertingkatkan. Pemilihan penggunaan program Basic4Android (B4A) adalah disebabkan untuk mendalami pengunaan program komputer dalam pengantaramukaan komputer dari peringkat asas. Projek ini terbahagi kepada tiga bahagian. Bahagian pertama akan memberi penekanan kepada gerak kerja penghasilan aturcara untuk pengantaramukaaan, masukan data dan pemasaan. Bahagian kedua pula adalah mengenal pasti komponen yang diperlukan dan mereka perkakasan untuk projek ini. Bahagian ketiga adalah menggabungkan semua bahagian yang berkaitan. Dalam projek ini komponen utama yang digunakan ialah DC motor, Arduino dan telefon pintar Android. Sistem ini menggunakan teknologi Bluetooth sebagai plafform daripada sambungan dan pengantaramuka kepada peranti Android. Sistem ini terdiri daripada lima pergerakan yang boleh bergerak ke hadapan, bergerak ke belakang, ke kiri, belok kanan dan berhenti. Projek reka bentuk ini adalah menggunakan kos yang agak rendah. Pengantaramuka membawa kelebihan kos rendah, berkelajuan tinggi dan mempunyai keserasian untuk menggunakan bahasa komputer tinggi.

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ABSTRACT

This project is to design a system by using combination of software and hardware which have the ability to control and operate the movement of the baby stroller in wirelessly by using Android technology. Through it, knowledge in design and using programming in Arduino software for interfacing purpose can be learns and improves. The selection of Basic4Android (B4A) software is for better fundemental understanding on computer program application in the computer interfacing. This project will be separate to three parts. The first part is designing the software for interfacing, data key in and timing. The second part is finding and designing the hardware for the project. The third part is joining the entire component that had been design. In this project, the main component will be used is DC motor, Arduino Board and Android based devices. The system use Bluetooth technology as the plafform of the connectivity and interface to the Android device. The system consist of five movement control which is can moving forward, moving backward, turn left, turn right and also stop.The advantages of this design are the cost is quite low. Interfacing takes advantages of low cost, high speed input or output port and compatible with high level languages.

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DEDICATION

Alhamdullillah, praise to the Almighty ALLAH S.W.T.

This thesis is dedicated to

My beloved family,
My Friends,
and my lecturer
Thanks for their encouragement and support.

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My gratitude goes to my beloved family and all my friends that always gives courage and supports me to achieve the goal of my project. Thank for their moral support and great care that they had given to me. Even though they are not always with me, but the family bond keeps us together every moment.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

AC	-	Alternating Current
ASCII	-	American Standard Code for Information Interchange
B4A	-	Basic4 Android
DC	-	Direct Current
EEPROM	-	Electrically Erasable Programmable Read-Only Memory
FTK	-	Faculty of Engineering Technology
GND	-	Ground
ICSP	-	In Circuit Serial Programming
IDE	-	Integrated Development Environment
I/O	-	Input or Output
PSM	-	Projek Sarjana Muda
PWM	-	Pulse Width Modulation
RC	-	Radio Control
RX	-	Receiver
SRAM	-	Static random-access memory
TX	-	Transmitter
USB	-	Universal Serial Bus
UTeM	-	Universiti Teknikal Malaysia Melaka

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CHAPTER 1
INTRODUCTION

This chapter will provide brief explanation about the project. Besides, it will cover the objective, scope of work, problem statement, methodology and report structure of the project.

1.1 Background

Transporting and carrying babies and young children is not an easy task, especially for parents who have more than three kids. Baby stroller are specially designed to help parents and less the load, while keeping their child comfortable and safe whether on short trips or on the travel. This project is expected to add a new innovation to the current existing technology instead of manually movement control to the movement control by Android application and Bluetooth is used as the platform of the connection. In modern day as life become more challenger parents often appreciate any help they get to help them cope with challenging task of taking care of their children.

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1.2 Problem Statement

a) In the old days, there were a number of stories about stroller losing a wheel control because of a bump in the road or sliding down a hill. The best way to avoid stroller accidents is to keep babies strapped in whenever they are in the stroller even on the shortest jaunts and when the stroller in the rest. The majority of stroller accidents occur when babies fall out of their strollers.

b) Parents usually use the handle of the stroller for hanging the grocery bags or other heavy items that could cause a stroller to fall. Much less often, babies are injured by stroller that collapses while they are in the stroller.

c) While in the shopping complex or in the mall, parents usually faced several problem to control the movement of the stroller as they are also need to control the shopping trolley. Other than that, parents also faced several difficulties to control the stroller especially when they bring their child to travel such as jogging and hiking.

d) The latest and modern stroller is design with material of frames with heavy weight, it make parent fell tired to push the stroller. So by having a movement control by Android application parents can easily move the stroller in the easy way.

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1.3 Objective

The goal for this project is to minimize the risk of the mentioned problem. So the objectives for this project have been defined to serve as a guide to achieve the goal. The objectives are:

1. To understand and gain knowledge about the basic concept of Android application and B4A software.
2. To simulate and develop Arduino application in order to control the movement of DC motor.
3. To design and develop a device that enhances the functionality of Android application usage.

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1.4 Scope of Work

The work scope listed to ensure the project is conducted within its intended time frame and scale. This work scope is also helps to ensure that the project is heading in the right direction to achieve the objective. This project covers software design using Java programming in the B4A software and establish as Android application to interface smart phone. Beside simulation by using Proteus software and Real Term are also used before proceed to hardware part.

This Android interface is design to control DC motor of the baby stroller. A Bluetooth technology is use as the platform of connection in this project. For wireless connection, Bluetooth is used to allow low bandwidth. Wireless communication involves any form of communication without using wire. Information may be transferred between two or more points that are not physically connected.

The aim is to enhance the functionality of Android application in order to control the movement of baby stroller by wirelessly. It involves two parts which is hardware and software. For the hardware part, it consists of Android based phone, baby stroller, tyre and DC motor gear. For the software part, Arduino IDE has been used to program the Arduino board and B4A software is used to create interface of Android application.

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1.5 Report Structure

This thesis is divided into five chapters to provide clear understanding about this whole project. It also shows the logical steps involved in understanding and gaining an appreciation of the methodology used to produce the prototype of the project.

Chapter 1: The first chapter introduces brief idea of the project. It will cover the overview of the project. This chapter will be including the synopsis of the project, the project objective, and scope of the project, the problem statement and outcome of the project.

Chapter 2: This part is the medium to get information in order to develop the project. The information will classify by a journal, articles, and books and some related interview.

Chapter 3: It will cover up all the methodology and a project implementation process to make the goal achieved. The hardware and software technical details also are explained in this chapter.

Chapter 4: This is the important chapter for this project. This chapter will contain the development and implementation of the whole project. This chapter also gives a critical analysis of the system; a determination is made on whether the project objectives have been met. This chapter will include theoretical and actual findings and circuit simulation result.

Chapter 5: This chapter is the whole contents of this project and thesis. At the end of this chapter, some references, discussions and attachment will be includes for future references.

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CHAPTER 2
LITERATURE REVIEW

In order to make this project successful, some studies and information has been done. The information is skimmed from many sources such as books, articles, journals, and internet. All of this information is very useful as a guide in doing this project. This studies of information based on some major component and topic that related to the project that will be used in the project such as hardware and software.

2.1 Background of Baby Stroller

Various method of baby transport has been used across different cultures and period and for different ages of child. For infant normally lies down facing the pusher and this are called 'Stroller'. These strollers are normally used for children up to about three years old in sitting facing forward.

As the child grow up and starts to gaining weight, parent will really appreciate the extra mobility that can help them cope with challenging task of taking care of their children (Wing, 2012).

Different baby stroller is designed with different material of frame. Some of the baby stroller is designed with heavy material and the range weight of the baby stroller now a day is around 5 kg to 10 kg.

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2.2 Android

Nowadays, millions of people are using mobile devices, smart phone and table computers. Smartphone has become the matter which often conversation in public nowadays. Android is an operating system for mobile devices such as smart phones and tablet computers. Android is developed by the Open Handset Alliance led by Google. Google purchased this Android operating system from its initial developer in 2005. More than 80 hardware, software, and telecommunication companies joined Goggle and formed a consortium, called the Open Handset Alliance. This consortium designed and released the advanced open standards of the Android operating system for mobile devices version in 2007 (Mohan, 2013).

Figure 2.0 : Icon Android (Mohan, 2013)

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