

**BUSITEMA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER
ENGINEERING**

**AUTOMATED PARKING LOCK DISABLER
SYSTEM**

BY

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DECLARATION

I MURUNGI YEKONIA with Registration Number BU/UG/2012/2031 do hereby declare this Project entitled “Automated Parking Lock Disabler System” as my original work except where explicit citation has been made and that it has never been submitted to any Institution of higher learning for academic award.

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APPROVAL

The undersigned certify that he has read and hereby recommend for acceptance of a Busitema University Project report entitled “ **Automated Parking Lock Disabler System**”

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LIST OF ABBREVIATIONS

KCCA- Kampala Capital City Authority

SMS- Short Message Service

SIM- Subscriber Identity Module

PWM-Pulse Width Modulation

EEPROM- Electrically Erasable Programmable Read Only Memory

MODEM- Modulator Demodulator

USB-Universal Serial Bus

CPU-Central Processing Unit

PIC- Programmable Interface Controllers

LCD-Liquid Crystal Display

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ABSTRACT

This is a report of an Automated Parking Lock Disabler System that automatically opens the fine lock at parking lanes upon clearing fine dues. The system was based on an atmega 328 microcontroller interfaced with a GSM modem, an administrator and an LCD to control the opening of a motorized lock. The device will enable penalized street parkers have the locks automatically removed off their vehicles after entering validity information

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CHAPTER ONE

INTRODUCTION

1.0 Background

The provision of car parking is a fundamental component of all urban developments. Insufficient car parking provision can lead to congested, unsafe traffic conditions or result in illegal parking and may impact on the commercial viability of businesses. Conversely, an over-provision of car parking spaces may encourage car use and is an uneconomical use of urban land. A factor in the success of a development or activity center is the level of transport access and parking provided. Developers and business operators often consider it a necessity that adequate car parking spaces are provided to meet demand and assist with the commercial viability of their businesses. Inadequate parking provision can result in overspill parking on residential streets, generating on-street congestion and creating potential adverse economic impacts on relevant businesses (Auron, 2013).

A number of reports and research papers have been written on the economic impacts of parking policy, in particular, on parking restraint measures that are designed to reduce car use within town centers (Rose, 2006).

The use of a parking fee and the subsequent system of pricing is considered to be the most effective parking management tool and, as such, the majority of the papers investigating the economics of parking are concerned with the use of and the structure of parking fees. No data can be found on the economic effects of reducing the supply of parking other than how this increases the price of parking (where parking fees are used) (Litman, 2006).

A car parking fee or levy, maximum parking rates or substantial changes to current parking restrictions are considered as parking restraints. The level of fee or levy needs to be considered in the context of the current 'market', being dependent on the current price of alternative transport modes and available alternative parking facilities (Zanule, 2015).

In Kampala, Multiplex Uganda is the contractor company tasked to manage commercial parking around the city. The company reports to the city authorities KCCA with a monthly pay of

80million Uganda shillings (Musisi, 2012). The company had partnered with mobile money utility companies-Airtel and MTN but the deal was not successful.

1.1 Problem statement

The use of a parking fee and the subsequent system of pricing is considered to be the most effective parking management tool around Kampala and other major cities in the country. A delay in paying the parking fines is penalized with locking the car with a public car lock. However, this is so inconveniencing when one pays the fines as they have to go back to authorities with proof of payment to have the locks removed. There is need for an automated system that removes the public car lock when ones clears the penalty fee to overcome the burden of inconvenience and time wastage.

1.2 Main objective

To design and implement an automated parking lock disabler system

1.3 Specific objectives

- (i) To study the current street parking management approaches and gather system requirements for the parking lock disabler system.
- (ii) To design a module that interfaces the mobile phone with the microcontroller through the GSM modem
- (iii) To design a module that effects the servo motor and shows these effects on an LCD
- (iv) To integrate the modules and implement the proposed system
- (v) To test and validate the proposed system.

1.4 Justification

The clearance procedures are so inconveniencing when one pays the fines as they have to report back to multiplex authorities with proof of payment to have the lock removed off their vehicles. Consequently, car owners' waste time and the process is more tedious when it is weekends as the service providers are scarce in any on streets. There is need for an automated system that removes the public car lock when ones clears the penalty fee to overcome the burden of inconvenience and time wastage.

1.5 Scope

1.5.1 Content scope

The project proposes the design and construction of an automated parking lock disabler system upon fine clearance based on the entrance of a valid ticket number. The system will ensure that the parking fine lock is removed instantly upon fine fees clearance. This shall be effected upon entrance of a valid ticket number.

1.5.2 Time scope

This system shall be implemented in six months' time from the time of proposal.

1.5.3 Geographic scope

This system will be implemented in Kampala areas where multiplex Uganda is contracted to provide parking service.

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