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APPLICATION OF SENSOR NETWORK IN LOCATING MOVING TRAINS FOR RAIL GATE SECURITY SYSTEM

A dissertation submitted to the
Department of Electrical Engineering, University of Moratuwa
in partial fulfillment of the requirements for the
degree of Master of Science



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DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree or diploma and is also not being concurrently submitted for any other degree or diploma.

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ABSTRACT

This research project is designed for rail gate security system for vehicles and pedestrian.

Currently, the railway system of Sri Lanka does not have a correct system to monitor and indicate correct positions of trains. Therefore vehicle drivers and pedestrians imagine the location of trains and try to cross level crossings. Hence accidents happen at rail gates. A suitable security system should be arranged at rail gates. Hence this project is done to find the correct position of the train.



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The outcome of the research would provide a time indicator and a distance indicator are fixed at level crossings. The time indicator indicates time duration of trains approaching the level crossings and the distance indicator indicates the distance in between the train and the level crossing. This timely information to the people who try to cross level crossings on foot or by vehicles will be very useful to protect their lives. Also this will be a good source for Sri Lanka railway system to track trains and protect human beings.

This project consists of three main subsystems such as

1. When a train passes a specified detection point, the time indicator counts down and the distance indicator indicates the distance in between the train and the level crossing.
2. When the train passes other specified detection points the time indicator and the distance indicator indicates time as zero.
3. When the train passes the level crossing rest the computer program.

DEDICATION

This work is dedicated to my parents late



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and Mrs C.D.Leena Perera

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TERMS AND ABBREVIATIONS

Positioning on One Device	P _{OD}
Kilo meter	km
Hour	h
Meter	m
Kilo ohm	k Ω
Micro farad	μ f
Hertz	Hz
Seconds	s
Velocity	v
Infrared	IR
Infrared Receiver at point A	IR _A
Infrared Receiver at point B	IR _B
Infrared Receiver at point C	IR _C
Infrared Receiver at point D	IR _D

Infrared Receiver at point E	IR _E
Infrared Receiver at point F	IR _F
Infrared Receiver at point G	IR _G
Infrared Receiver at point H	IR _H
Superintendent	SD
Ultrasonic sensor	US
Ultrasonic sensor at point A	US _A
Ultrasonic sensor at point B	US _B
Ultrasonic sensor at point C	US _C
Ultrasonic sensor at point D	US _D
Ultrasonic sensor at point E	US _E
Ultrasonic sensor at point F	US _F
Ultrasonic sensor at point G	US _G
Ultrasonic sensor at point H	US _H



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