INTELLIGENT TRAFFIC LIGHT CONTROL WITH EMERGENCY AMBULANCE CLEARANCE

<table>
<thead>
<tr>
<th>Name</th>
<th>Student ID</th>
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<tbody>
<tr>
<td>Abdullah AlDossary</td>
<td>201600575</td>
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<td>Abdurahman Haboudal</td>
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<td>Hassan AlShahrani</td>
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<td>Nawaf AlDossary</td>
<td>201302624</td>
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**Advisor:** DR. JAWAD FAWAZ AL ASAD  
**Co-Advisor:** DR. Muhammad Omair Butt

**May 17th, 2022**
OUTLINE

▪ Traffic Light Introduction
▪ Problem Statement
▪ Proposed Solution
▪ Project Objectives
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▪ Planning
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▪ Integration
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▪ TESTED
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▪ New Skills Acquired and Applied
▪ Cost
▪ References
▪ Video Link
The congestion of traffic in streets
The overcrowding
Road accidents.
All these factors lead us to think about intelligent traffic light and monitor system
PROBLEM STATEMENT

- Traffic cars in road needs to be monitored
- Avoiding time delay for emergencies situations
PROPOSED SOLUTION

DESIGN OF SMART TRAFFIC LIGHT CONTROL AND MONITORING SYSTEM

FACILITATE THE CROSSING OF AMBULANCES AND IMPORTANT CARS
PROJECT OBJECTIVES

- Design of smart traffic light control and monitoring
- Minimize and avoid traffic congestion
- Minimize waiting time
- Reducing accidents
- Facilitating the work of ambulances
- Facilitate crossing vehicles
- Practical implementation of the system
- Performance evaluation
COMPONENT

Arduino Mega (ATmega1280)

Seven segment LED

CD4511 – A BCD to 7-Segment Display Driver Chip

Speak Recognition, Voice Recognition Module V3 MOD54

Round IR Receiver Transmitter LED-Photo Diode & Photo Transistor
- Design subsystem 1 (How to control the normal light traffic)
- Design the simulation intersection (subsystem 1)
- Implement ambulance clearance detection system
- Validate ambulance clearance system
- Implement the IR sensor to detect cars and control in each intersection in the system
- Implement the seven-segment display in every road intersection
- Implement the intelligent traffic algorithm (coding), which is control the traffic intersection
- Integrate Intelligent traffic light control system with emergency ambulance clearance
- Design 3D printing and voice recognition configuration (subsystem 2)
- Implement industrial design model
- Test and validate all systems (subsystem 3)
- Finalize project demo
- Submit Rpt/PPT/Brochure/Video... etc.
BACKGROUND

Road deaths
Approximately 1.24 million people die each year as a result of road accidents, according to the WHO.
WHO ESTIMATED NUMBER OF ROAD TRAFFIC DEATHS PER 100,000 POPULATION GLOBALLY

Deaths per 100,000 population

- 0.0 - 8.2
- 8.2 - 14.3
- 14.3 - 21.5
- 21.5 - 28.4
- 28.4 - 36.2
- No comparable data

World Health Organisation (WHO), Global Health Observatory (GHO) data [Accessed 20th April 2018]
DESIGN: STRUCTURE OPTIONS

Traffic intersection, 1.5x1.5 m, 20 cm width for each road

3D PRINT TRAFFIC

DEMO CARS

3D PRINT IR SENSOR COVER
DESIGN: STRUCTURE OPTIONS

- 3D Printer Traffic and soldering
INTEGRATION

- IR alignment and testing
- Vehicle entrance and exit
- Hidden wires Connection
BONUS FEATURE (IOT)

- Blink application to monitor and control complete traffic system
- Beside the smart traffic light we added a blink app to monitor and control the system. The application is sync with the real traffic light system in the intersection. The normal counter is from zero to five which indicates there is no car.
DESIGN: COMPLETED WORK

- Implement ambulance clearance detection system
- Validate ambulance clearance system
- Implement the seven-segment display
- 3D printer traffic intersection design
- Implement the IR sensor
- Finalizing the industrial design model, and the voice recognition (subsystem 2)
- Test and validate all system (subsystem 3)
Tested the voice recognitions

Tested the traffic control

Implementing car counting
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<tr>
<th>Task</th>
<th>Abdullah</th>
<th>Hassan</th>
<th>Nawaf</th>
<th>Abdurahman</th>
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**PROJECT MANAGEMENT & TEAMWORK**

- Teamwork task division
PROJECT MANAGEMENT & TEAMWORK
The most important impact for our project is saving lives by introducing ambulance clearance to the system.
NEW SKILLS ACQUIRED AND APPLIED

Learn more about Arduino and their types

Learn more about coding with the Arduino Controller

Deep analysis for the system

Give good information about 3D printing and the Features
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<th>Unit Cost (SR)</th>
<th>Subtotal</th>
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REFERENCES


