# Initial Documentation
## *Embedded & Beyond*
### *26.05.2022*

# 1  Team members

- Arsal Abbasi
- Muhammad Umer Bin Yaqoob
- Charles Okere

# 2  Introduction

The usual function of Traffic Light Controller requires some control and coordination to ensure that traffic runs smoothly and efficiently. There are a variety of control systems present that are used to accomplish this task, ranging from simple clockwork mechanisms to computerized control and coordination systems that adjust themselves to reduce the delay faced by people/car drivers on roads during their day to day lives.

Traffic Jam and delay on traffic signals affects many day-to-day workers and students. Many cases are reported in regular news which mentions the inability of students to attend exam due to traffic jams, and workers were reported late, and the major reason given was traffic jams in majority of the cases. To deal with this problem, we will build a smart traffic control system. This Traffic Control system will make sure that the traffic runs smoothly. Road Traffic Signal Controllers provide safe and smooth road traffic by controlling traffic according to the time of day and the circumstances on the road, as well as performing sophisticated traffic control to alleviate traffic congestion. The Traffic Light Controller will detect the cars at the intersection with the help of sensors present at each intersection and then it will work accordingly to the needs of traffic to avoid congestion and work smartly.

Concept description

*The main application of our Traffic Light Controller is that it will avoid traffic congestion and will work efficiently unlike normal traffic lights to avoid traffic issues. Basically our idea is that there is a highway which has intersection, and to avoid traffic jam our traffic light controller at the intersection will turn green only if the car wants to cross intersection and enter the highway, otherwise it will stay red and the traffic on highway will keep running smoothly.*

*For this idea, we will be using an infrared sensor at the intersection to detect a car when there is any car which wants to cross the intersection in order to enter highway, we will be using LEDs for traffic light, we will use modelsim to write vhdl code for this function, and lastly we will be using Eagle for PCB design.*

The Highway light will remain green until no cars are detected on intersection

Infrared Sensor

As soon as a car is detected the the intersection turns green after 60 seconds

Traffic light HW

Traffic Light IN

CONTROLLER (FPGA)

Infra-red sensor

Clock Input Signal

Traffic Controller SYSTEM

R
Y
G

L E D 'S

Sensor Input

Team Name