4-Way Traffic Light Project Proposal

**Course:** CIS 434  
**Instructor:** Almabrok Essa

Michael Conroy  
Roy Blahovec  
Alexander Darling (Team Lead)

# Overview of Requirements

The primary requirement of this project is to create a visual simulation of a 4-way traffic light.

The traffic lights must change based on timers and inputs from cars in the simulation. If a timer associated with a traffic light changes, and there are no cars waiting in other lanes, then the timer should reset. Cars in the simulation must be capable of entering a left turn lane, and the light should be receptive to cars in the left turn lane.

The simulation must take user input as part of its process for determining which lights turn on or off. In addition, the visuals of the 4-way traffic light must be user-friendly and should easily communicate what is occurring in the simulation at any time.

# Goals and Objectives

Our goal is to create the 4-way traffic light simulation with a frontend that allows users to view the simulation in real time and provide input that changes the traffic patterns, which subsequently changes the behavior of the 4-way traffic light.

Several objectives of this project include:

* A function that controls the behavior of the 4-way traffic light so that it changes based on traffic
* A function that pseudo-randomly generates traffic patterns based on user input
* A function that senses the presence of cars in certain lanes, and alerts the 4-way traffic light
* A user interface that displays the 4-way intersection and the cars in it
* A function that moves cars through the user interface, corresponding to traffic patterns
* A function that displays the lights currently on the 4-way traffic light

# Project Plan

Our plan includes multiple concurrent processes.

One process involves creating a static frontend with buttons that will alert the backend to begin, pause, and reset the simulation, as well as buttons that can modify the traffic patterns before the simulation. This GUI will update in real time as inputs from the traffic and 4-way lights

Another process involves simulating the behavior of traffic in each lane. The behavior of the traffic will change based on the quantity of cars currently in a lane, the incoming traffic flow, and the current state of the lights from the 4-way traffic light.

A third process involves a traffic detection system and a timer, both of which are used by the 4-way traffic light. The 4-way traffic will manage the types of lights it displays in real time by using these 2 systems.

The frontend will be designed in HTML & CSS. Behavior of the traffic and the logic of the 4-way light will be controlled through JavaScript.

The project will use Git’s version control system to manage code and will host the git repository on GitHub. The team will communicate using a custom Slack channel.

# Projected Roles and Responsibilities

Alexander Darling is the team lead for this project. He will be primarily responsible for managing the traffic detection system and the logic of the 4-way traffic light. He will also be the primary writer for the reports.

Roy will be primarily responsible for determining how traffic stacks up based on user input, as well as how the traffic behaves in response to the 4-way traffic light.

Michael will be primarily responsible for rendering the frontend and hooking the buttons to the functionality designed by Roy and Alexander.

Both Roy and Michael will be primarily responsible for presenting and demoing the final project to the class.