EECS4312 Lab 6

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Revisions

Date	Revision	Description
4 November 2015	1.0	Initial specification of system, R/E- descriptions, and function table.

Contents

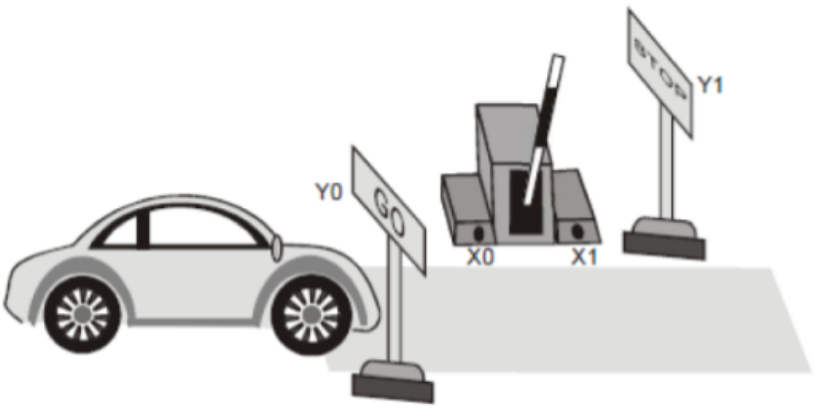

Figure 1: Reference design.

1 System Introduction

The Entry/Exit of the parking lot is a single lane passage. By controlling the indicators, the program ensures that only one car can pass through the Entry/Exit so as to prevent a car accident between entering and leaving cars.

2 E/R Descriptions

2.1 Requirement Descriptions

REQ1	The controller will allow only one car within the passage at a time.	By monitoring sensors the system will ensure both gates will not be open at the same time.

REQ2	A car wishing to park will have priority over the cars which want to leave.	If both sensors are on, the entering gate will open.

2.2 Environment Descriptions

ENV1	The sensors can only ever read ON or OFF.	Only 2 states for each sensor.

ENV2	The actuators can only ever be GO or STOP.	Can only ever indicate either 2 states.

3 List of Variables

3.1 Controlled Variables

Each of the controlled variables represents an ACTUATOR which has two states; either STOP or GO.

Name	Description
X1	Car entering sensor. ON when a car passes through the sense.
X2	Car leaving sensor. ON when a car passes through the sense.

3.2 Monitored Variables

Each of the monitored variables represents an SENSOR which has two states; either ON or OFF.

Name	Description
Y1	Car entering indicator, indicates GO when a car would like to enter.
Y2	Car leaving indicator, indicates GO when a car would like to leave.

4 Car Function Table

The function table presents a variable 'i' in DTIME which captures the value of both, the sensors and actuators, at each DTIME step.

Input		Output
x1(i) = on AND x2(i) = on		y1(i) = go AND y2(i) = stop
x1(i) = off AND x2(i) = on	y1(i-1) = stop AND y2(i-1) = stop	y1(i) = stop AND y2(i) = go
	NOT (y1(i-1) = stop AND y2(i-1) = stop)	y1(i) = stop AND y2(i) = stop
x1(i) = on AND x2(i) = off	y1(i-1) = stop AND y2(i-1) = stop	y1(i) = go AND y2(i) = stop
	NOT (y1(i-1) = stop AND y2(i-1) = stop)	y1(i) = stop AND y2(i) = stop
x1(i) = off AND x2(i) = off		y1(i) = go AND y2(i) = stop