

## ECE 243S – Computer Organization – 2016

### Project Proposal Form

After ensuring that your project idea is unique, you will use this form to describe your project (point form preferred), assess its difficulty, and outline what you expect to achieve each week of your project work. You **must submit the filled form on Blackboard two days before your scheduled project lab session and bring it to the first project lab session.**

The TA will advise you if changes are needed to your project proposal so it is sufficiently, but not overly challenging. After you implement the changes, **the TA will then approve your project proposal.** You will then make **two copies** of the final filled form: one will be kept by the TA, and the other one will be for your reference. Your ability to successfully implement all that was approved in your proposal will determine your project functionality marks.

### Group Info

Station Number	First Name	Last Name	Student Number	Contribution [0..100] (filled during 3 <sup>rd</sup> lab)
23	Aishni	Arora	1001511214	
23	Pranit	Wadkar	1001142710	

### One Sentence Project Description (as posted on Piazza)

Autonomous Line Following Forklift: The lego device follows a line path, picks an object present on the path and places it at a height on a stack of objects.

## Technical Description of the Project

Describe your project in more technical details and include a system block diagram.

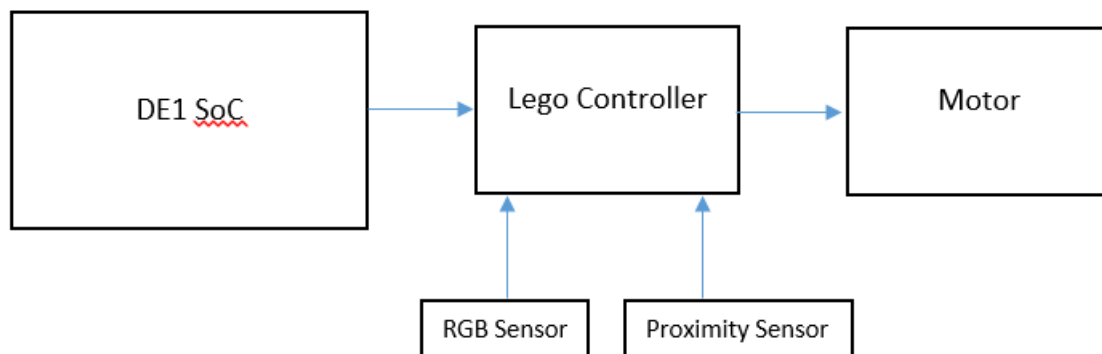
We are planning to create a lego forklift which can follow a line made on the surface using an rgb sensor.

The forklift will be fitted with proximity sensors which will detect when the forklift is in close proximity of an obstacle.

The first obstacle that it reaches, will be the object that the forklift would have to lift.

The forklift then continues along the line. The second obstacle that it detects will be the stack of objects on top of which it would have to place the object which it is carrying.

The prongs of the forklift will also have proximity sensors, and the prongs will continue to move upwards until they reach the top of the stack, after which the forklift will place the object.



## Technical Description of the Project Core

The project core is a minimum part of your project that you are committing to deliver. Failing to implement this part will result in loss of functionality marks.

Describe your project core here.

The core of the project is to develop an algorithm that can direct a device along a line. And make it be able to sense and lift the first object and to sense the second object and place the first object on top of it.

## Assessment of Project's Difficulty

Please check off each accomplishment you propose in your project and indicate whether that accomplishment is part of the project core and whether it is interrupt-driven (if applicable). For accomplishments with multiple units such as the LEDs, switches, motors, etc., indicate the number of such units used. For example if you are using two Lego motors place the number 2 in the column instead of a checkmark.

Accomplishment	Proposed?	Project Core?	Interrupt?	Demonstrated? (to be filled by your TA)
Push buttons				
Digital protoboard				
VGA			N/A	
Lego motors	2		N/A	
Lego sensors (value mode)	yes			
Lego sensors (state mode)	yes			
Linking C with assembly			N/A	
JTAG UART transmit				
JTAG UART receive				
Timer	yes			
Hex keypad (rows or columns only)				
Hex keypad (rows and columns)				
DMA transfer				
Nios II Custom Instruction			N/A	
Audio Codec output to speakers				
Audio Codec input from microphone				
PS/2 Keyboard				
PS/2 Mouse				
SD Card Reader				
Custom Bus Component				
Ethernet				
IrDA UART				
Video input				
ADC				

Please describe any other devices or complex software algorithms you will use. Remember to keep this relevant to ECE243 (not fancy electronic circuits or complex mechanical systems).

## Project Milestones

Describe what parts of your project you will have fully implemented in each of the three project lab sessions. Keep in mind that you will have to demonstrate your project during the third project lab session. The key here is to design incrementally: get something working quickly and keep adding to it. TAs will not accept the “integrate everything in week 3” approach.

### First project lab session

Work on lego device  
Work on Line following

### Second project lab session

Get line following working  
start working on object detection and lifting

### Third project lab session – Demo

Get lifting of obstacle and placing on top of stack working

## TA Notes

This page is filled by your TA.

## Approval

Approved by \_\_\_\_\_

Date \_\_\_\_\_

## First project lab session

## Second project lab session

## Third project lab session – Demo