# Progress Presentation-I

## e-Yantra Summer Internship-2019

Robot Designing using FPGA


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# Overview of Project



- Project Name:
  Robot Designing using Field Programmable Gate Array (FPGA)
- Objective:
  To interface the basic building blocks of robot with FPGA, that performs simple robotic functions like line following.
- Deliverables:
  - Display the line sensor readings on the LCD
  - A robot that is able to follow black line

# Overview of Tasks



| # | Tasks |
|---|---|
| 1 | Understand the DE0-Nano board and NIOS Processor in the FPGA |
| 2 | Interface an analog sensor with FPGA |
| 3 | Interface 16x2 LCD with FPGA |
| 4 | Combine the display and analog sensors |
| 5 | Interface motor driver and motor encoders |
| 6 | Design a power management circuit |
| 7 | Combine all the building blocks together |
| 9 | Line following algorithm and coding |
| 8 | Motor encoder based movements |
| 10 | Testing and Debugging |
| 11 | Documentation and creating user manual |

# Tasks Remaining



- Switch for robot movements - Encoder based and Line sensor based movements.
- Documentation and User Manual.
- Optimize the code

# Design Block Diagram



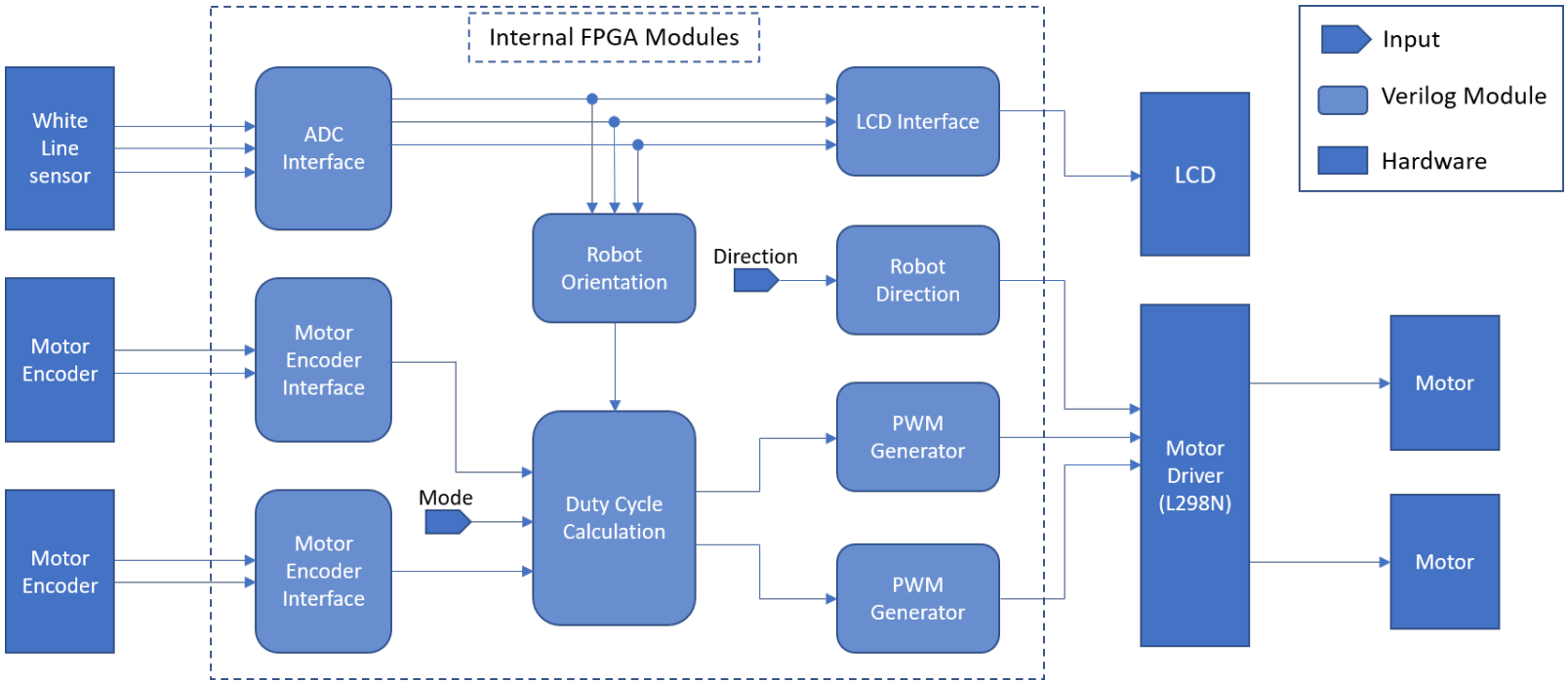
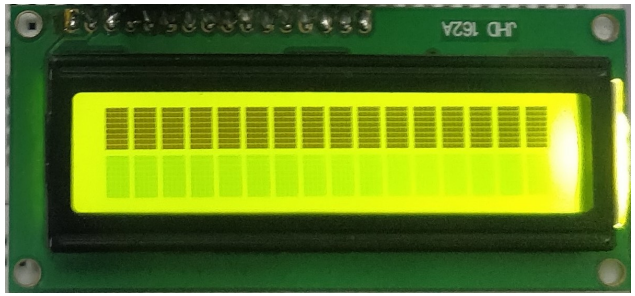



Figure: Verilog Design Block Diagram

# Challenges Faced



- Difficulty in interfacing the LCD with 8-bit datalines.
  Timing constraint in sending commands and data to LCD.



(a) LCD initialization error


(b) LCD Working with 4 datalines

- Calculation of motor speed with the motor encoder pulses.

# Thank You!

Any Queries