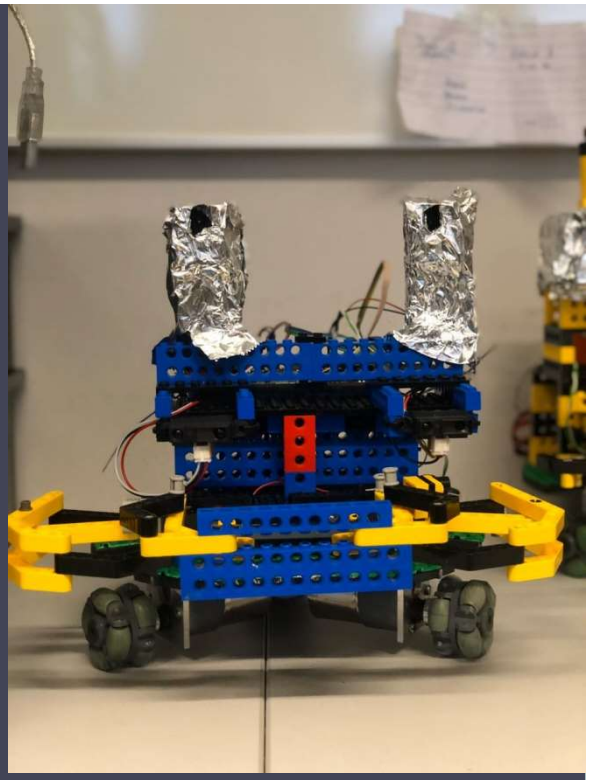
Embedded Systems Lab Project



Presented by:
Swathi Sudeendra Rao
Philip Okonkwo
Mehul Kumar uttamchand
Shubhangi Sisodiya

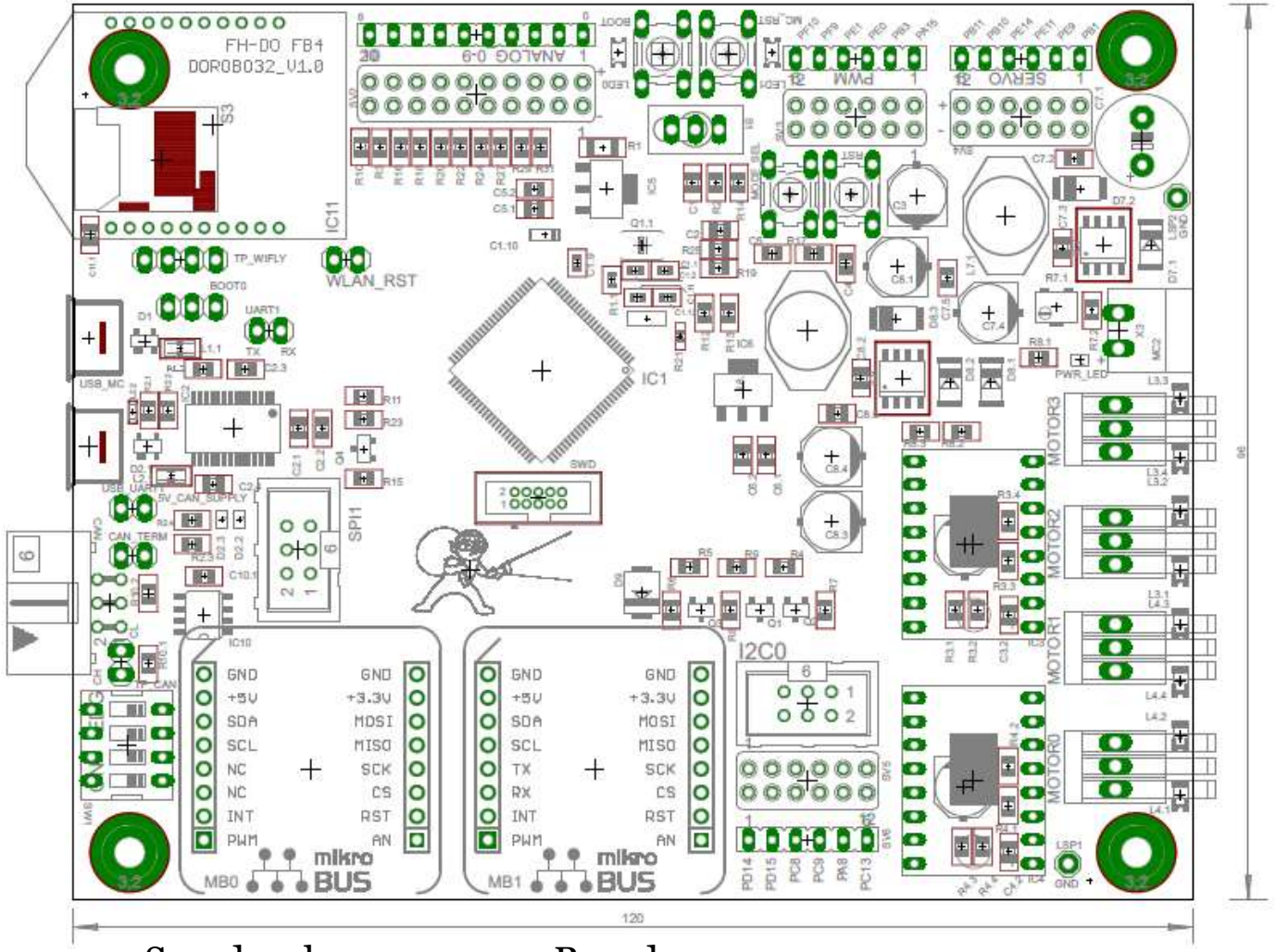
Under the guidance of:
Prof. Dr. Rolf Schuster

Fachhochschule Dortmund
University of Applied Sciences and Arts

Objective

- Calibrate the sensors
- Build a bot using the LEGOS
- Reach the target within specified time by avoiding the obstacles

Dorobo32 Board



Src: dorobo_32_v1_0_Board

MicroSwitch

- Used to get the input from the DAC
- Used PULLUP configuration

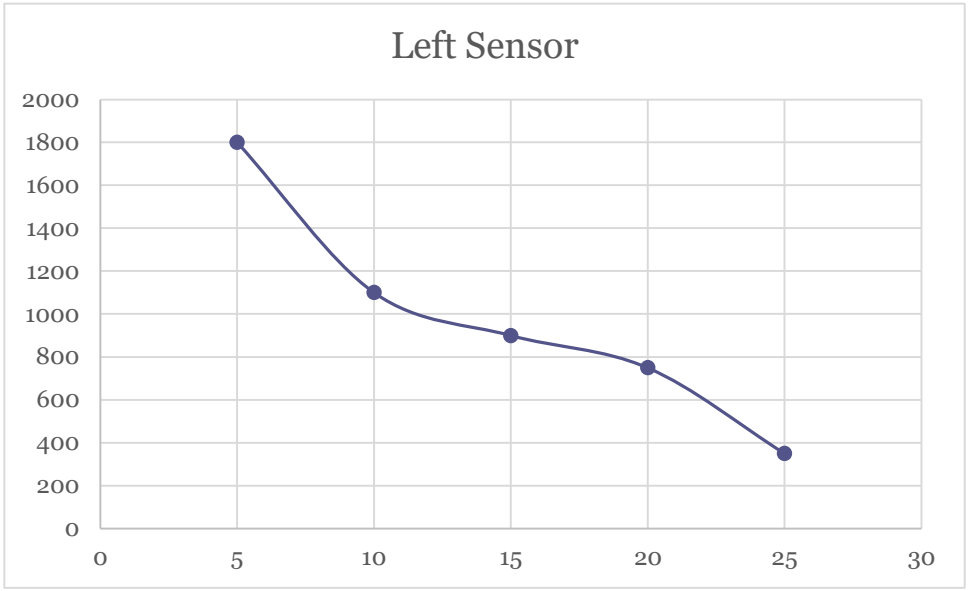
If **detected** an obstacle, a **0** is passed as an output

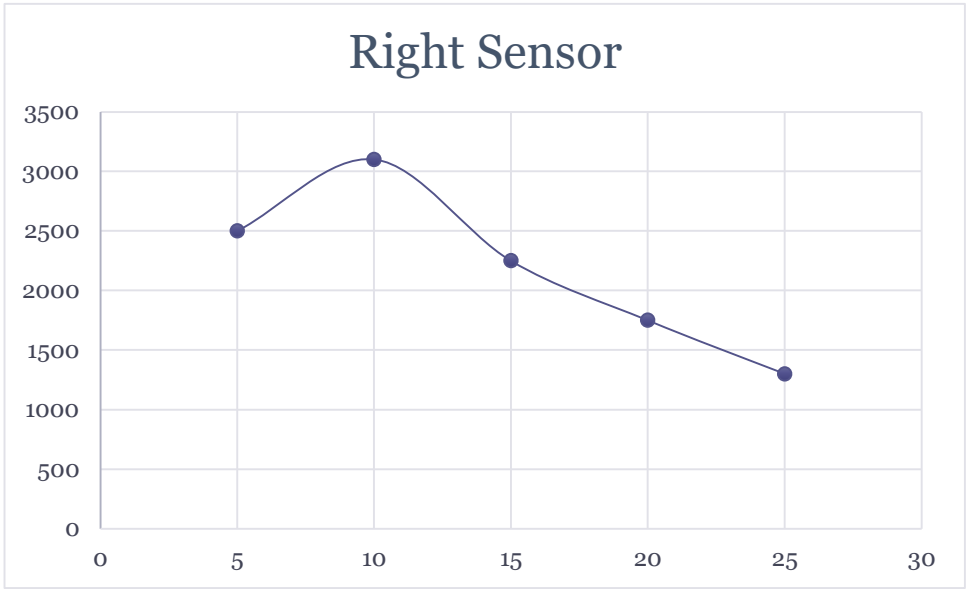
IR Distance Sensors

- Used to get the input from the ADC
- Distance and voltage relationship evaluated
- Obstacle within a range of **15cm**, action taken

LEFT	
Dist(cm)	Voltage(V)
5	1800
10	1100
15	900
20	750
25	350
infinity	325

RIGHT	
Dist(cm)	Voltage(V)
5	2500
10	3100
15	2250
20	1750
25	1300
infinity	0

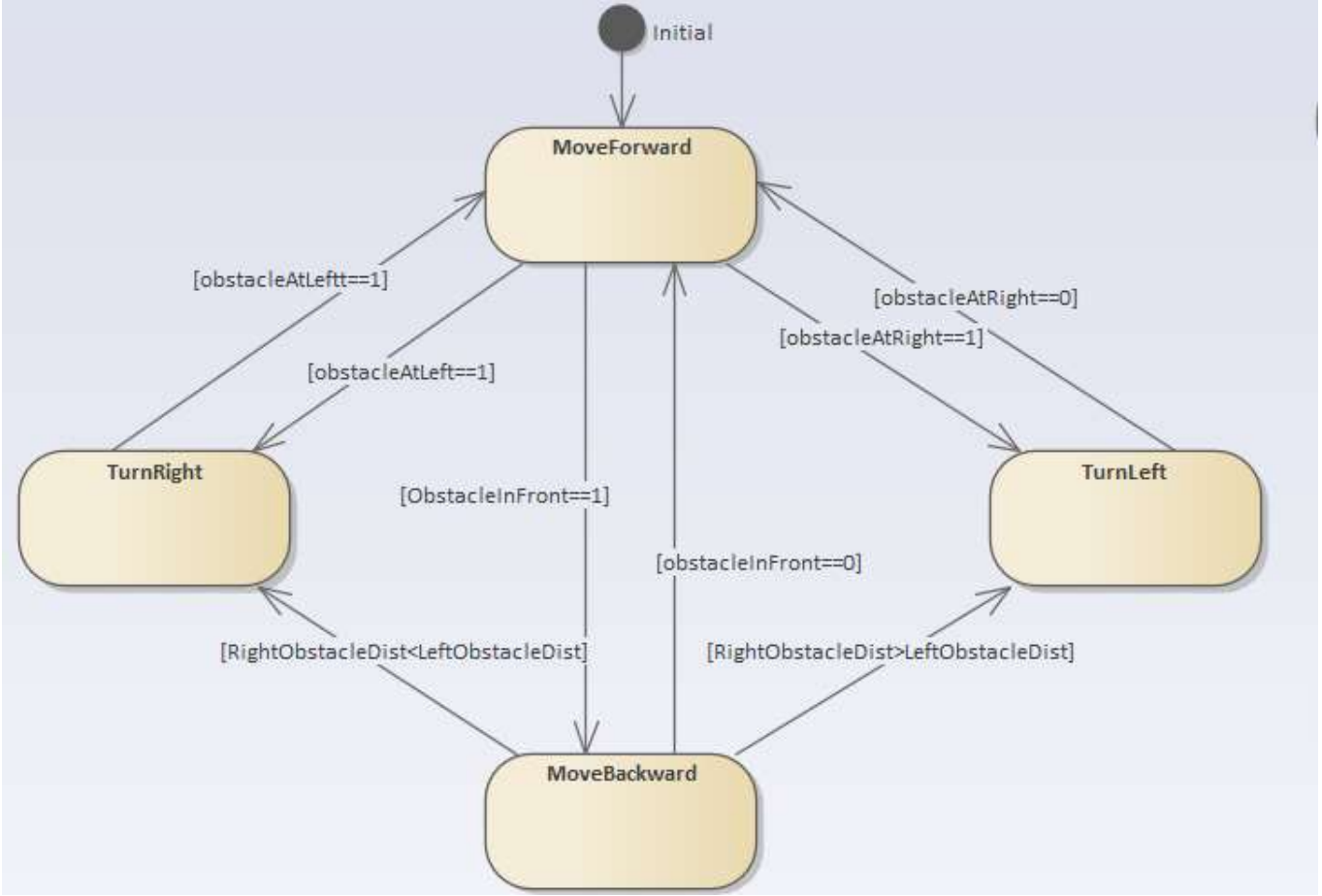

Left Sensor
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
5
10
15
20
25
30


Right Sensor
3500
3000
2500
2000
1500
1000
500
0
0
5
10
15
20
25
30

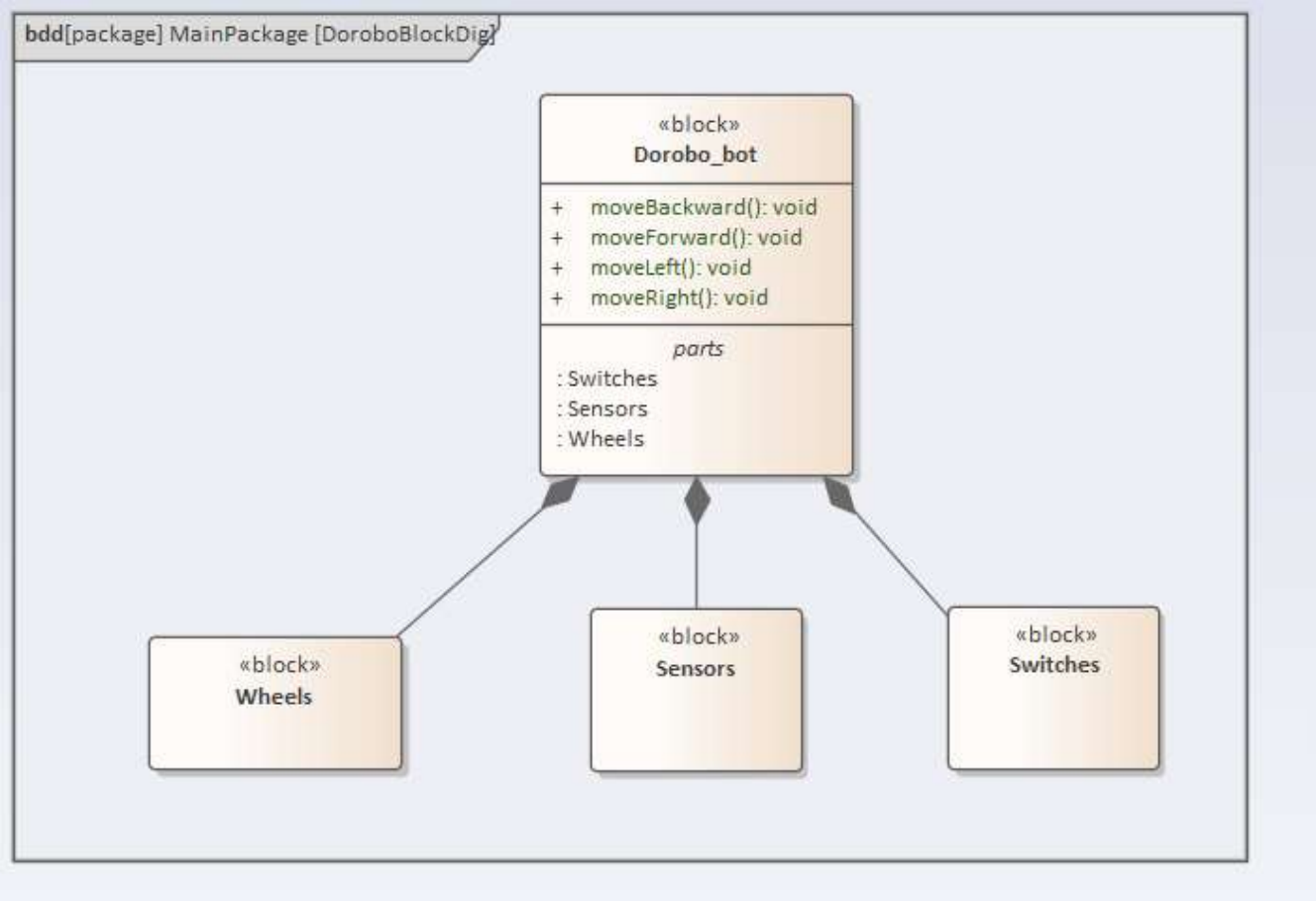
IR target sensor

- Used to get the input from the DAC
- Used PULLUP configuration
- Frequency component of the input signal to determine was taken as 125Hz

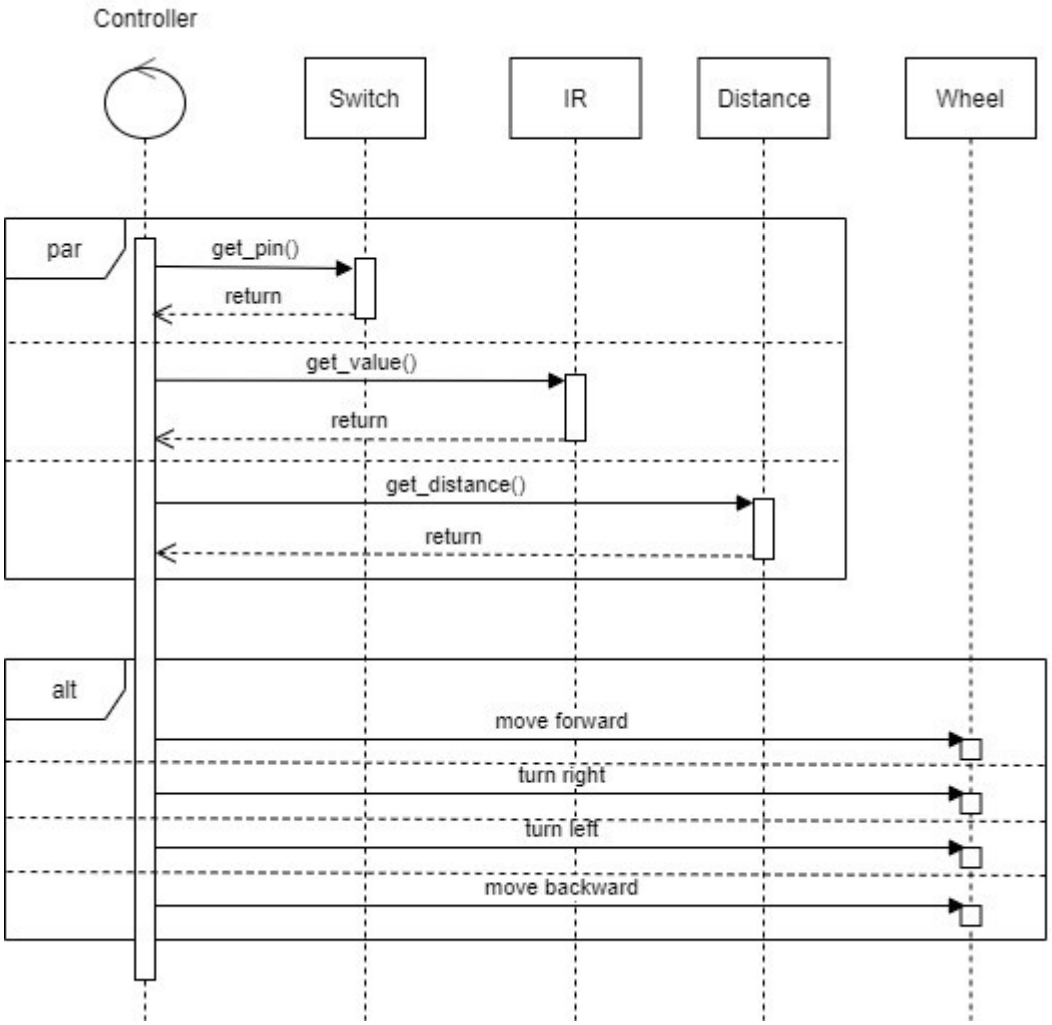
State Diagram



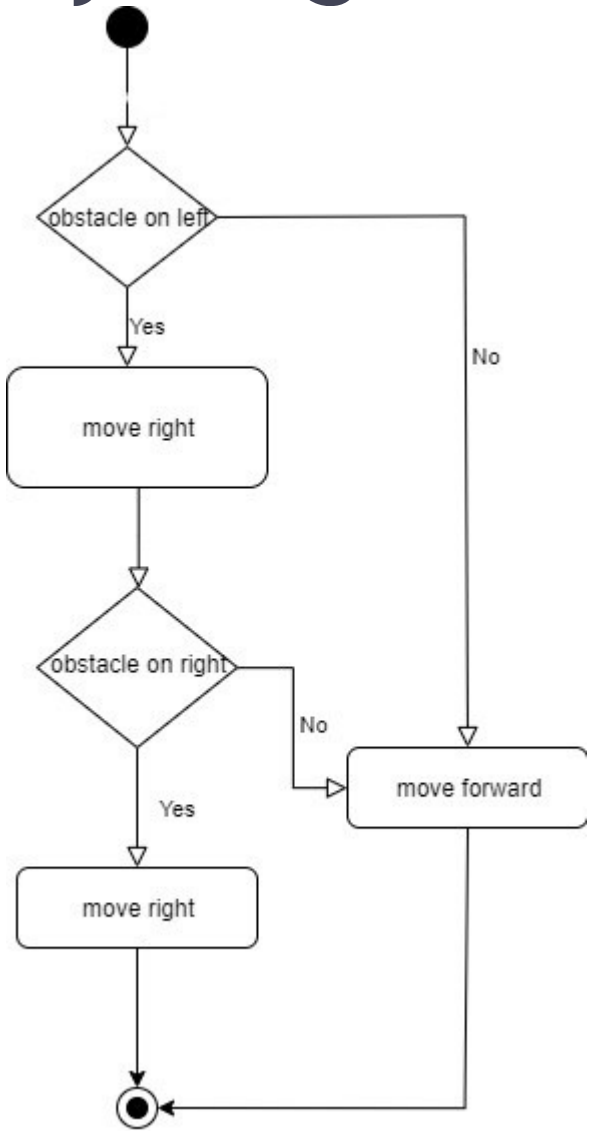
Block Diagram



Sequence Diagram



Activity Diagram for Corners



Conclusion

- Configured sensors: Distance, target
- Configured switches
- Robot detects the obstacles and moves as desired

THANK YOU

Any questions?