Line Follower RC Robot

Presented by:-

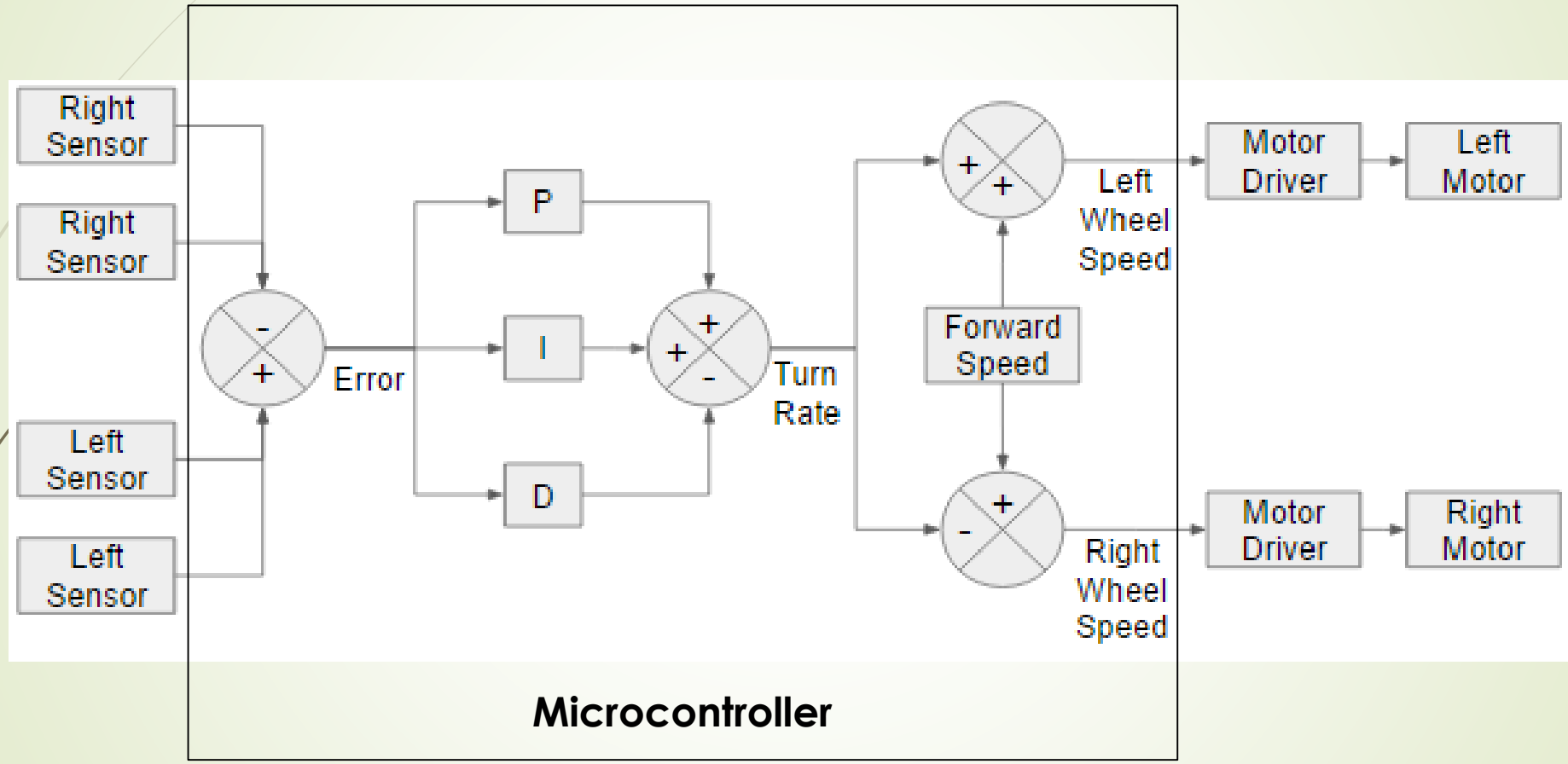
Amit Manchanda (14116013)

Swabhiman Patnaik (14116069)

Introduction

- Construction of a robot that follows a path on a contrasting background (line-follower)
- The path will consist of a free-shaped line (in our case we will use black line on white background).
- A remote control feature to let the user start and stop the robot at anytime.
- The robot should be equipped with Tiva series Cortex Arm processors.
- It should also implement communication interfacing such as UART, SSI etc.

Block Diagram



Hardware Components

- A 3 wheel, differential drive robot with 2 driving wheels in the back and one castor wheel in the front.
- Two 100 rpm motors along with a dual motor driver to power the bridge the microprocessor and motor.
- A line array IR sensor to detect the line (path).
- For remote control, Bluetooth module(HC-05) is proposed which will enable communication with smart phone.
- Finally the robot will be powered by 9 V Li battery, whose voltage will be stepped down with the help of a 7805 voltage regulator.

Software Components

- Keil uVision IDE – For programming the Tiva board
  - PID algorithm for smooth motion
  - PWM for adjusting speed of motor
  - UART for Bluetooth communication
- Android Studio – For interfacing and controlling robot with smart phone
  - Bluetooth connectivity with Tiva

Total Estimated Cost of Project

Name	Price per unit	No. of units	Total cost
IR Sensor	400	1	400
Motor Driver	250	1	250
Bluetooth	250	1	250
Motors(100 rpm)	150	2	300
Wheels (2 cm width)	30	2	60
Castor wheel	20	1	20
Li ion battery	650	1	650
		Total :-	1930

Thank You