Speed Modulated Bot Via Color Signals

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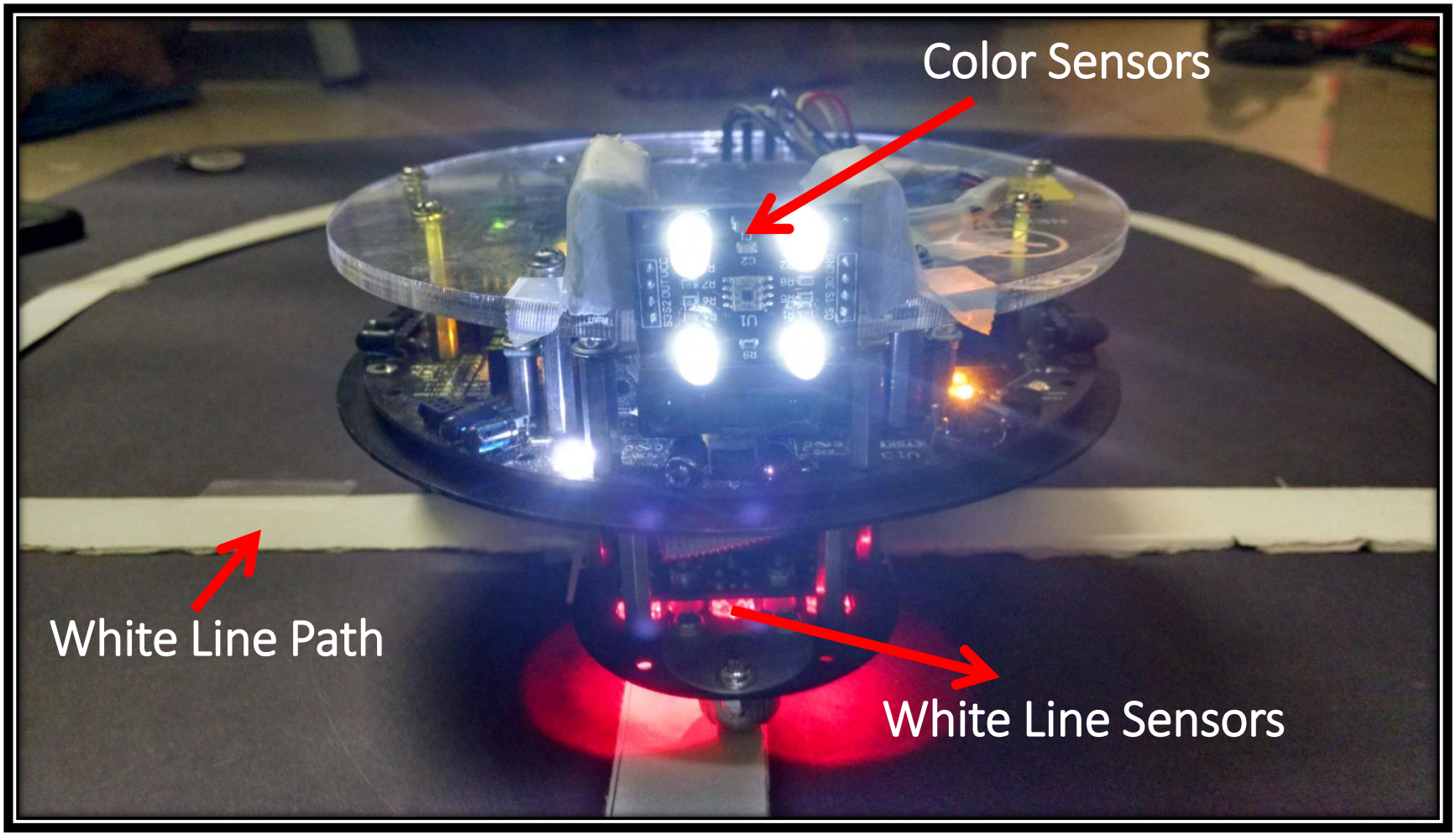
PROJECT BOT

FIREBIRD V – ATMEGA 2560

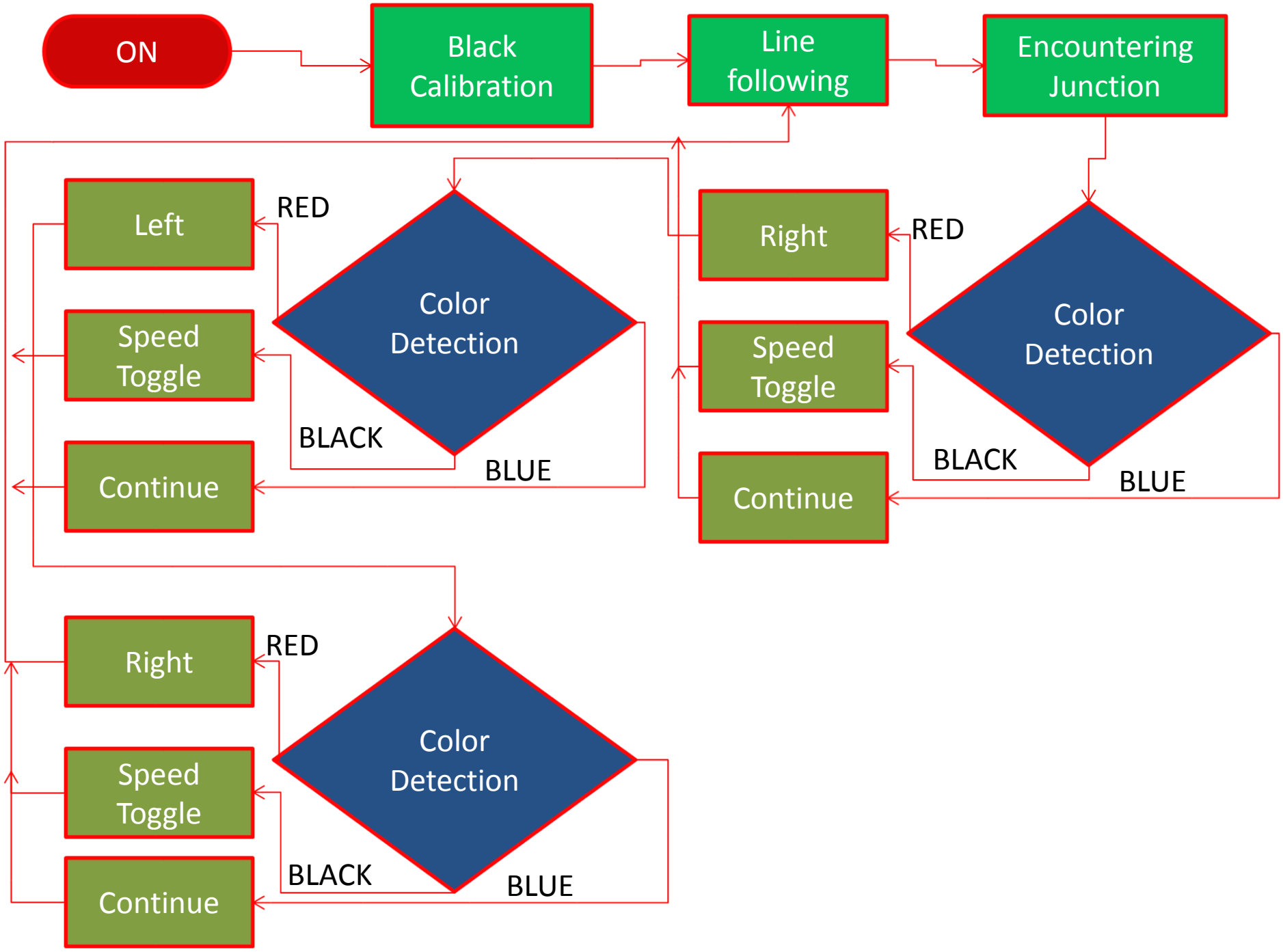


PROBLEM STATEMENT

- Development of an automated Firebird V Speed modulated bot using colored banners.

- Our **Goals** were :
  - ✓ PID line follower which stops at junction
  - ✓ Color detection
  - ✓ Variation of speed using PWM
  - ✓ Controlled rotation

FUNCTIONALITY OF BOT


ON
Black Calibration
Line following
Encountering Junction
Left
RED
Color Detection
Speed Toggle
BLACK
Continue
BLUE
Right
RED
Color Detection
Speed Toggle
BLACK
Continue
BLUE
Right
RED
Color Detection
Speed Toggle
BLACK
Continue
BLUE

P.I.D.

- PID stands for proportional-integral-differential.
- The PID controller algorithm involves three separate constant parameters: the proportional, the integral and derivative values, denoted *P, I,* and *D*

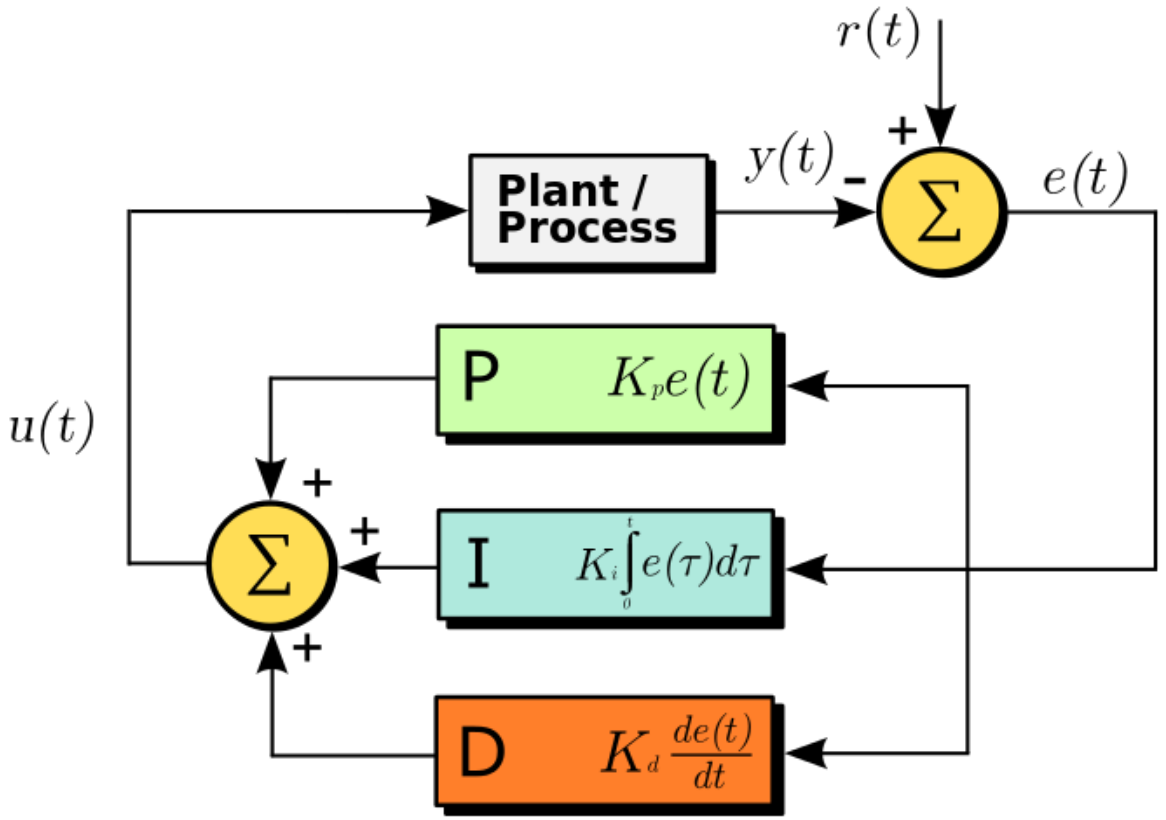


Image Source: Wikipedia

COLOR SENSOR

- It is used to identify four colors : RED ,BLUE , GREEN , BLACK .
- It generates a square waveform .
- The frequency of the waveform varies when sensor is exposed to different colors.

CHALLENGES

- Difficulty in choosing appropriate error , differential and integral constants for PID white line code .
- Overshoot at the turn for higher speed values .
- Irregular performance of the servo motor provided .
- Inappropriate pulse measurement of green color by color sensor

  (more pulses of blue than green) .

FUTURE PROSPECTS

- Our project may be used as a template for further works on automated cars.

For instance:

1. Integrating it with a smartphone interface to get the location of user and destination and choosing a path by itself.
2. It can be used for transportation over fixed routes like goods hauling or public transport.

THANK YOU!