Abstract

The line follower is an autonomous robot designed to follow a specific track. The bot senses the environment, recognises the path and moves accordingly. In this project, we have developed and implemented a line follower using an Arduino Nano microcontroller, TCRT5000 sensors, and a 2-dc motor differential drive. The robot is programmed using PID Algorithm to follow a white line on a dark background accurately.

The chassis is custom wooden made. The robot's hardware includes a custom-designed circuit board with a motor driver and voltage regulator on the perf board. The PID algorithm calculates the error between the actual setpoint and desired setpoint of the robot and adjusts the speed of the motors accordingly. The robot is capable of following complex paths and curves with high stability.

The line follower robot has many applications, including industrial automation, warehouse logistics and educational projects. The project demonstrates the use of microcontrollers, sensors, and motor control circuits in a real-world application and can serve as a basis for further development and customisation.