

TANK CRAWLER CHASSIS ROBOT

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A robot is a mechanical device that can be programmed to perform various tasks and interact with the environment without human intervention. Robotics is concerned robots [1].

I will tell you about my Tank Crawler Chassis Robot. It has functions such as: driving in any direction, switching on the front and back headlights by button, horn, activation of back lights when driving backwards, activation of back red light when driving stops, activation of emergency alarm (all three light flash), parking sensor, broadcast all ahead of the car by FPV (First Person View) camera. The camera is connected through a special device and broadcasts video to your phone. The robot is also controlled from the phone on distance with the help of a mobile application. The application was downloaded from Google play. However, nowadays this application is not available for downloading. The connection to the car is made with the help of Bluetooth module. The application sends a signal in the form of words, which the robot understands as it is written in its code (F-front, B-back and others). The application has a simple interface consisting of buttons: back, front, right, left, switch on/off headlights and so on.

The control system is based on the ATMEGA328P micro-controller. It is responsible for the software part of the system and performs the control functions. The ATmega328 microcontroller is a low-power 8-bit CMOS microcontroller built on an advanced AVR RISC architecture. The Arduino is a compact board with the ATmega328P controller. It has pins on it to which you can connect various devices. In my project Arduino is like the brain of the whole robot [2]. Arduino is programmed in a special application Arduino IDE, where programming is based on C/C++ programming languages.

The machine is moved by means of a platform with crawler tracks bought from an online shop. The crawler tracks on the platform are con-

trolled by each track having one driving wheel. Each driving wheel is connected to a stepper motor controlled by Arduino. The speed of the robot cannot be controlled as the motor is supplied with either 5V or 0V. This feature is because there are re-lay modules between the Arduino brain and the motors. The relay is a toggle switch controlled by the Arduino. By creating a magnetic field with an inductive coil, the relay can connect and disconnect contacts between each other. Each motor is powered by two relays. Each relay gives either + or -, which gives the direction of motor rotation.

All the lights are realized using standard LEDs “Light-emitting diode” bought or taken from old flashlight. They are also controlled by relay module. LED is a semiconductor light source, which emits light when current flows through it. Also there is a function of parking sensor realized with the help of ultrasonic distance sensor HC-SR04. The sensor consists of two peculiar eyes, one sends an ultrasonic signal, when it is reflected from the wall it is taken by the second eye. By measuring the time, it calculates the distance.

The body of the Tank Crawler Chassis Robot is opened by means of a servo. A servo drive is a mechanism with an electrically controlled motor. You can rotate the mechanical motor at a given angle at a given speed or force level. In the application, changing the slider from 0 to 100 changes the angle of the body covers from 0 to 90 degrees. The body of the robot was handmade from wood and plastic or printed on a 3D printer. The models to be printed on a 3D printer are made in Solid Work program. The robot is charged with 18650 batteries. The batteries can be removed and charged at a special charging station. However, in the robot's device, it is possible to charge all batteries via USB port using a regular phone charger.

References

1. Что такое робототехника : – URL: https://vex.examentech nolab.ru/lessons/unit_2_introduction_to_robotics/44/ (date of access: 03.03.2025).

2. Что такое Arduino: принцип работы и возможности платформы: – URL: <https://www.mvideo.ru/blog/pomogaem-razobratsya/chto-takoe-arduino-princzip-raboty-i-vozmozhnosti-platformy> (date of access: 04.03.2025).