

## **TKFR2: A Multi-function Robot**

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### **Abstract**

TKFR2 is a Multifunction Robot that the developers used to stand for the first Letters of the members of the group and their supervisor. The main goal of this project is to design and implement a prototype robot that can provide people with assistance, Information and sense of security. The robot has a face with eyes and mouth that lights up while communicating with the user. It has a nose that displays a color coded meaning. It has different sensors to sense the temperature, humidity, fire and obstacle. It uses Bluetooth technology to connect to a smart mobile phone, be controlled in three different ways – by infrared, by a mobile phone application and by giving it voice commands, and move around with its robot car part. It can answer some questions and instructions and is interactive because it can speak with its user using voice commands designed by the developers. It can move around in forward, backward, right and left directions depending on the issued command by remote control, mobile phone application or voice command. It can be asked to play or stop music, detect an intruder through its motion detector, and display some messages in its LCD display.

TKFR2 robot has different electronic parts made to intelligently work together to do all of the above-mentioned functions. Arduino boards (Mega and Uno), 1Sheeld board and a smart mobile phone were used to make these electronic parts provide what the developers intended it to do. The programs used to make all of the electronic parts smart were done using the Arduino Integrated Development Environment (IDE) software. The mobile phone application used in controlling the robot car was developed using the App Inventor. Overall, the group achieved their goal of acquiring a lot of knowledge that will benefit them when they graduate from this College.