

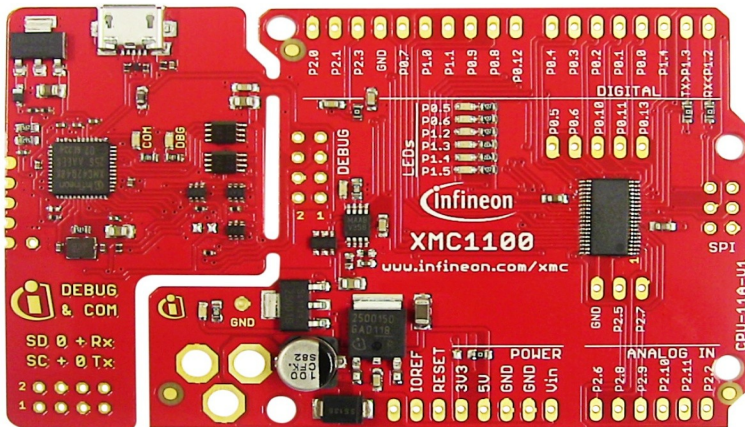
1. Student: Pricop Teodor



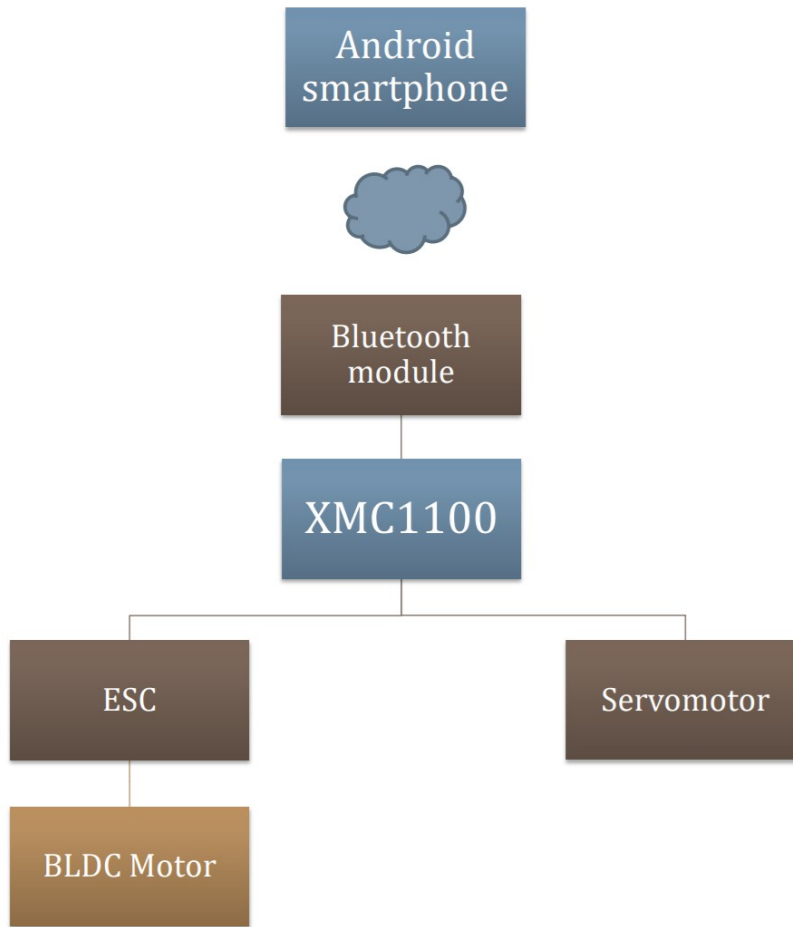
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1. Subject: Bluetooth controlled car
2. Summary:

The project is built on top of a RC car which I have modified to work with the XMC1100 microcontroller.



1. Introduction:

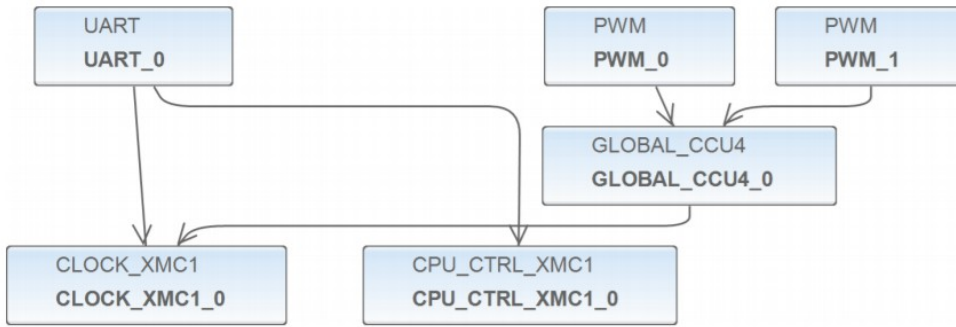


The microcontroller is listening for commands from the Bluetooth module via UART interface. After analyzing input, it updates the corresponding PWM channel for drive or steer.

1. Solution description:

The project is based on a client-server architecture:

- The microcontroller part was developed using Dave 4 with Dave APPS, as shown below:

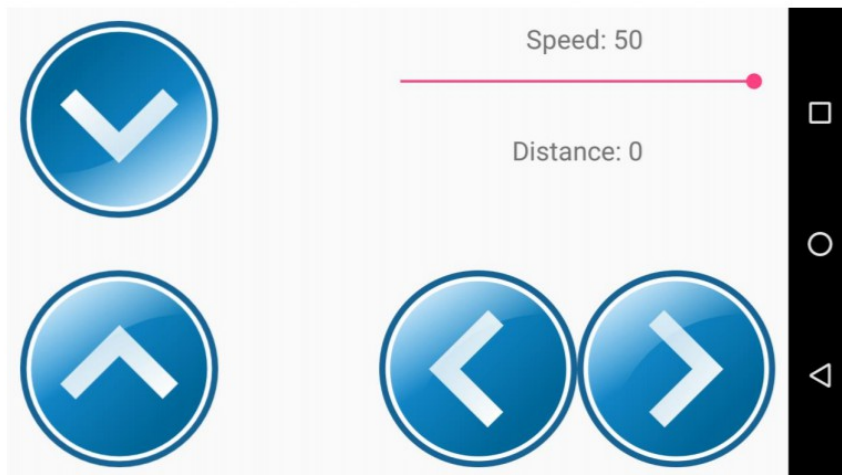


```

37 void command() {
38     if (cmd[0] == 'd') {
39         drive();
40     }
41     else if (cmd[0] == 's') {
42         steer();
43     }
44
45     UART_Receive(&UART_0, cmd, sizeof(cmd));
46 }

```

- On the client side, a simple application was developed using Android Studio, for communicating simple commands to the car:



The application is written in Java and uses Android's Bluetooth Low Energy API for communicating with the BLE module on the car.

```
void make(String request) {
    mCharacteristic.setValue(request);
    mBluetoothGatt.writeCharacteristic(mCharacteristic);
}

void drive(int value) {
    value = Math.max(-4, Math.min(4, value)) + 5;
    if (value != lastDrive) {
        make("d" + value);
        lastDrive = value;
    }
}

void steer(int value) {
    value = Math.max(-4, Math.min(4, value)) + 5;
    if (value != lastSteer) {
        make("s" + value);
        lastSteer = value;
    }
}
```

1. Bibliography:

https://www.infineon.com/dgdl/Infineon-Software_Development_Quick_Start+-UM-v01_00-EN.pdf?fileId=5546d4624cb7f111014ceb71ca922680
<https://www.infineon.com/dgdl?folderId=db3a3043134dde6001134ef5f8ff0281&fileId=db3a304344d727a80144d99976b2002b>
<https://developer.android.com/guide/topics/connectivity/bluetooth-le.html>
<https://developer.android.com/reference/android/bluetooth/BluetoothGatt.html>