POLITECHNIKA WROCŁAWSKA
WYDZIAŁ ELEKTRONIKI

KIERUNEK: Informatyka (INF)
SPECJALNOŚĆ: Internet Engineering (INE)

PRACA DYPLOMOWA MAGISTERSKA

Smartfon z systemem Android
jako wysokopoziomowy sterownik robota

Android smartphone
as a high-level controller of a robot

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Chapter 1

Introduction

1.1 Description of problem

1.2 Goal of a project

1.3 State of art

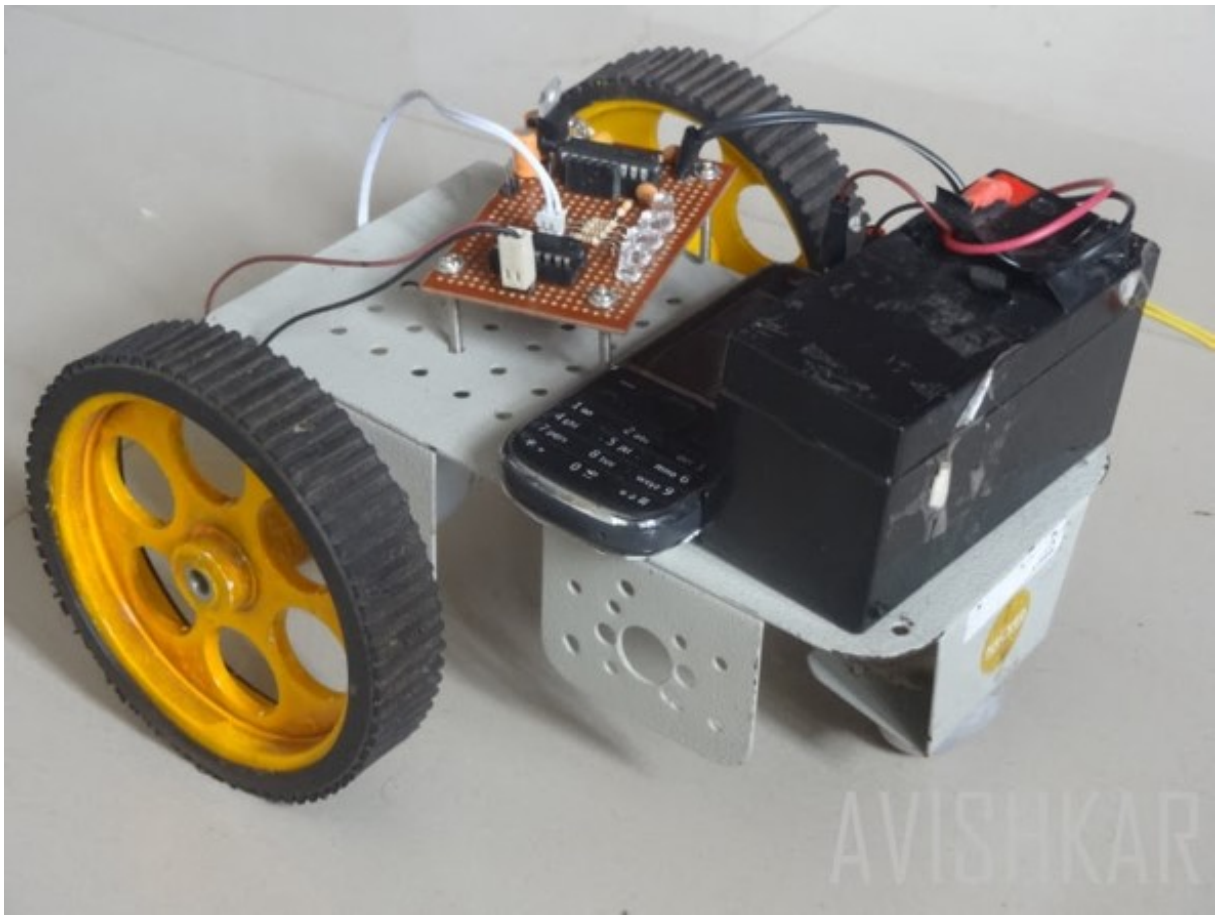

Figure 1.1 robot1, [1] fdfsdfsdf dgfdgdf gfhgfh

Figure 1.2 robot2, [2]

Figure 1.3 robot3, [3]

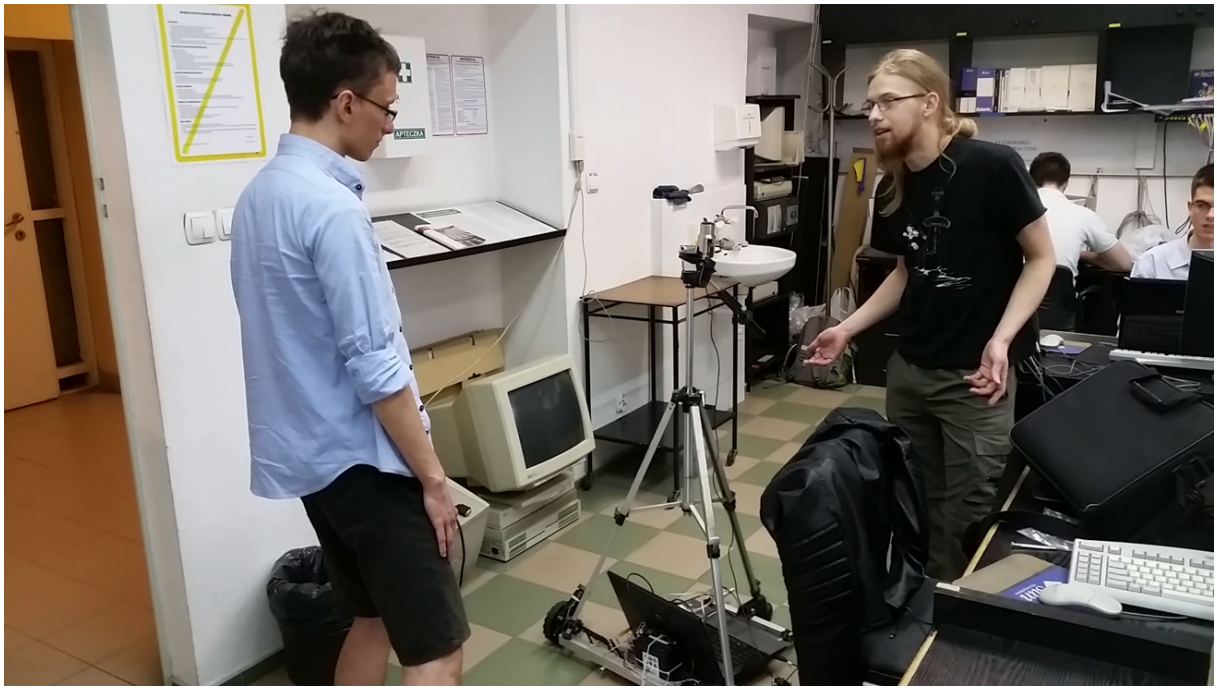

Figure 1.4 own robot

Chapter 2

Platforms

2.1 Android

2.2 MCU

Chapter 3

Communication

3.1 Introduction

3.2 Communication through USB cable - MCU

3.2.1 UART

3.2.2 CDC

3.3 Communication through USB cable - Android

Three ways to communicate over USB were found:

- USB Host API [4],
- usb-serial-for-android library by mik3y [8],
- UsbSerial by felHR85 [9].

3.3.1 USB Host API

3.3.2 mik3y

3.3.3 felHR85

3.4 Summary

Chapter 4

Sensors

4.1 Introduction

Modern smartphones has many sensors, and most of them can extend robot's functionality. Sensors differ between phones, and new (or more advanced) ones can be connected using possible connections (mostly USB and Bluetooth). Most popular ones are:

- touch screen,
- accelerometer,
- gyroscope,
- microphone(s),
- front and rear camera(s),
- position sensors:
  - GPS,
  - multilateration based on GSM and/or WiFi,
- magnetometer,
- light sensor,
- proximity sensor.

Some (mostly high-end, or specialized ones) have also sensors like electronic compass, humidity/temperature sensors, fingerprint scanner, or even thermal camera.

4.2 Face detection

Available implementations of face detection includes:

- FaceDetector API,
- Camera API,
- openCV for Android,
- openCV NDK.

4.2.1 FaceDetector API

4.2.2 Camera API

4.2.3 openCV for Android

4.2.4 openCV NDK

4.3 Summary

Chapter 5

Summary

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