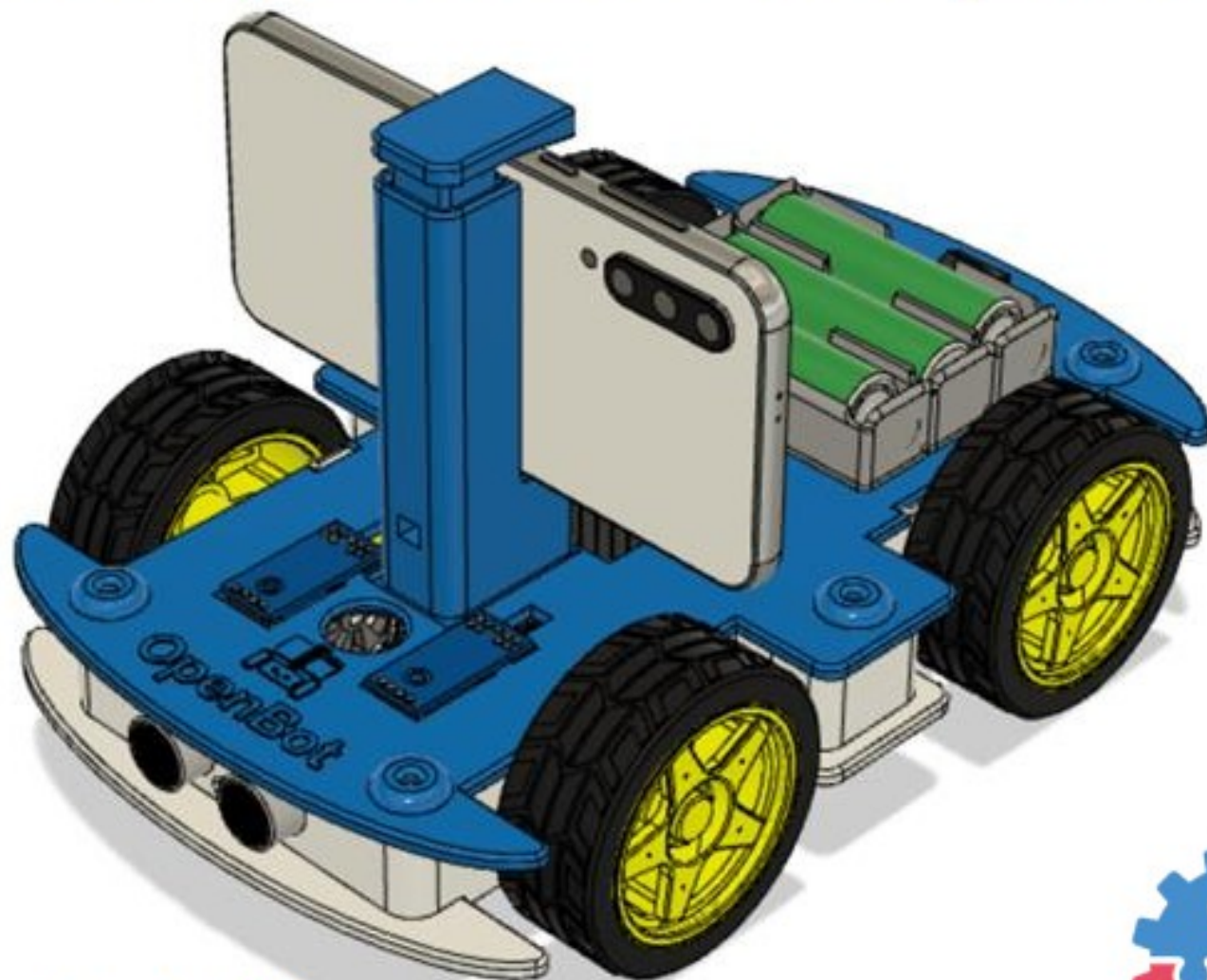


OpenBot: mobilný telefón ako palubný počítač



R. Balogh + A. Lúčny

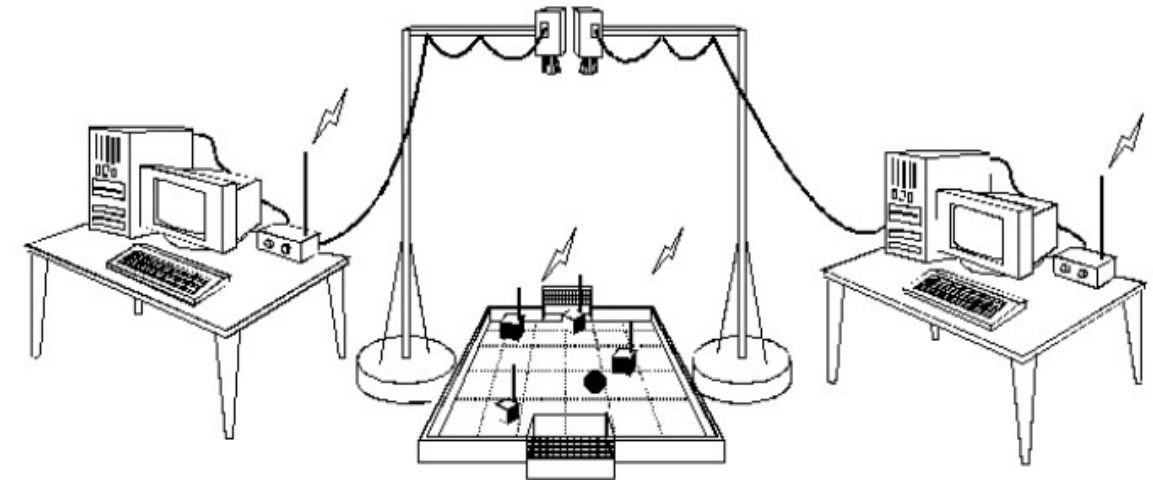
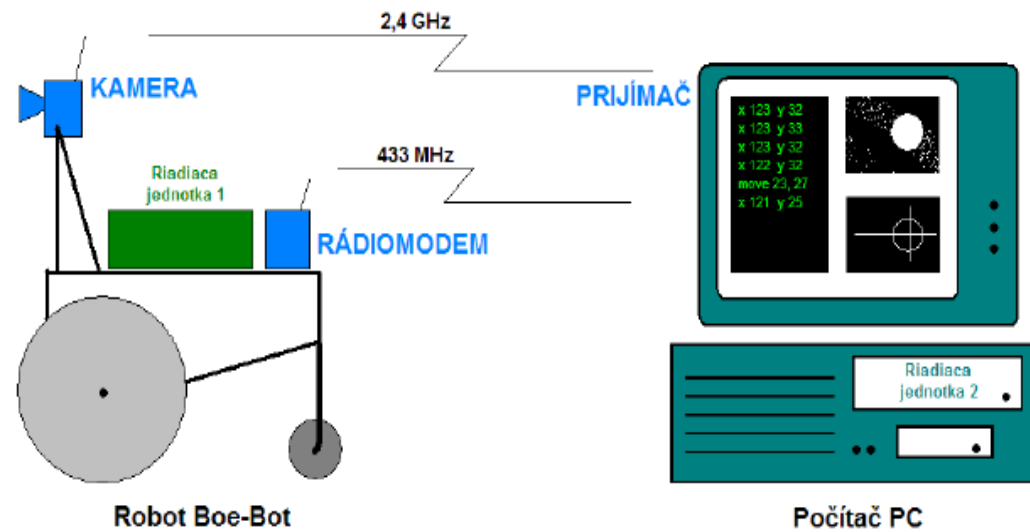


SEMINÁR
ROBOTIKA.SK

Čo je to robot?



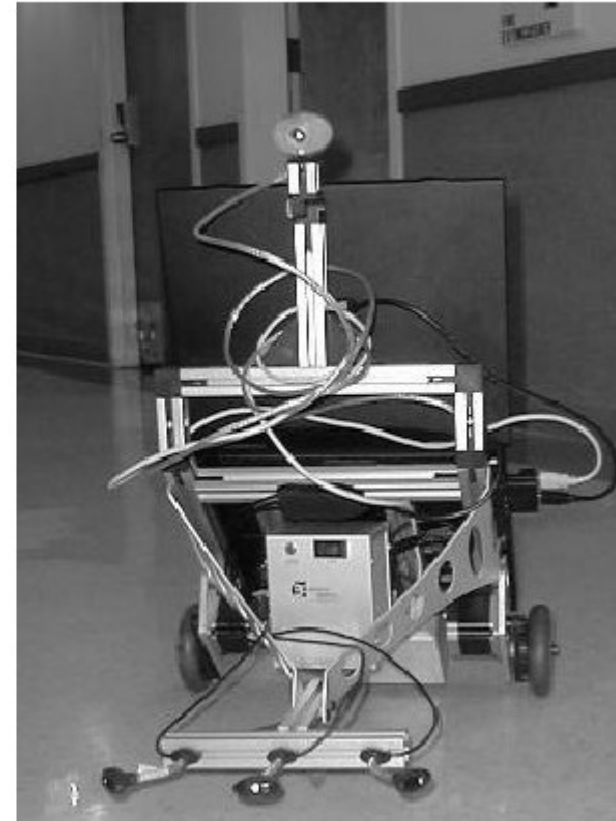
Priestorová dislokácia mobilného robota



Je nevyhnutné, aby celý robot sídlil v jednom tele?

Evolution Robotics ER-1

- 2002
- \$900
- Windows 98



Parallax Eddie



MIDbot

Calliope iRobot





Romo: The Smartphone Robot for Everyone



Koya Ono and Hitoshi Ogawa / Procedia Technology 18 (2014) 37 – 41

(a)

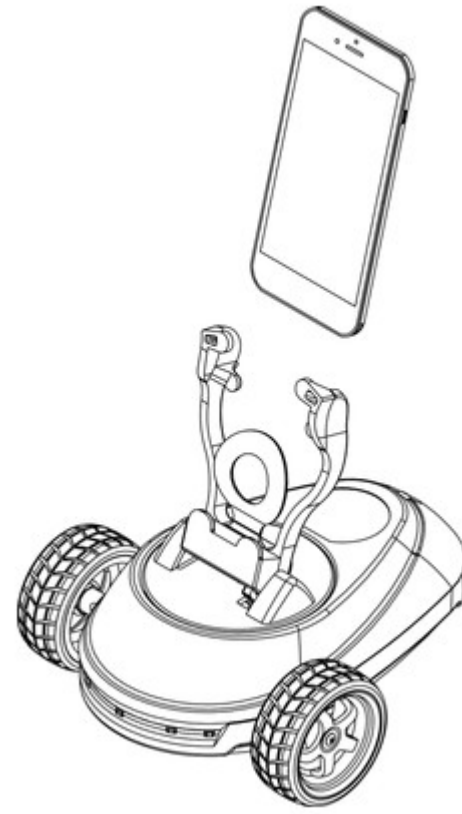


(b)



Fig. 2. (a) Front view; (b) Side view

Robobo



Robobo

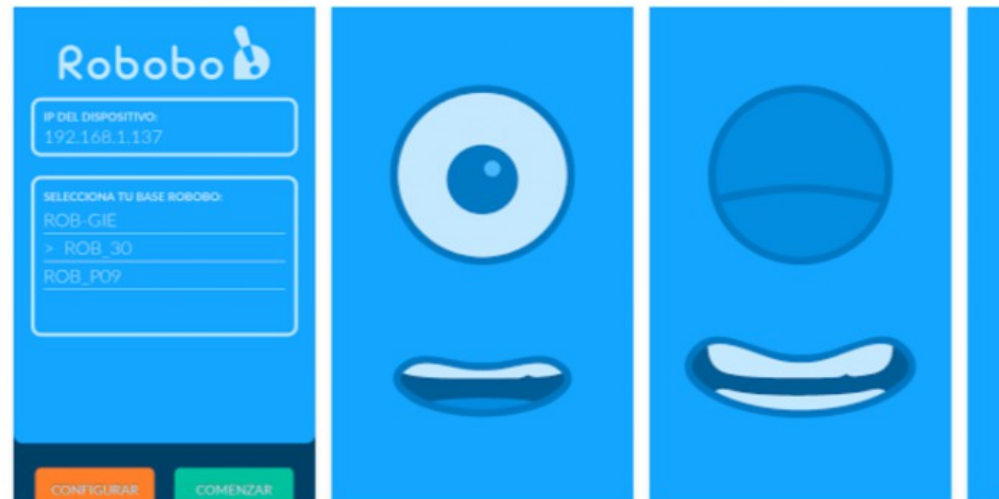
Mytech Ingeniería Aplicada S. L. Educación

 PEGI 3

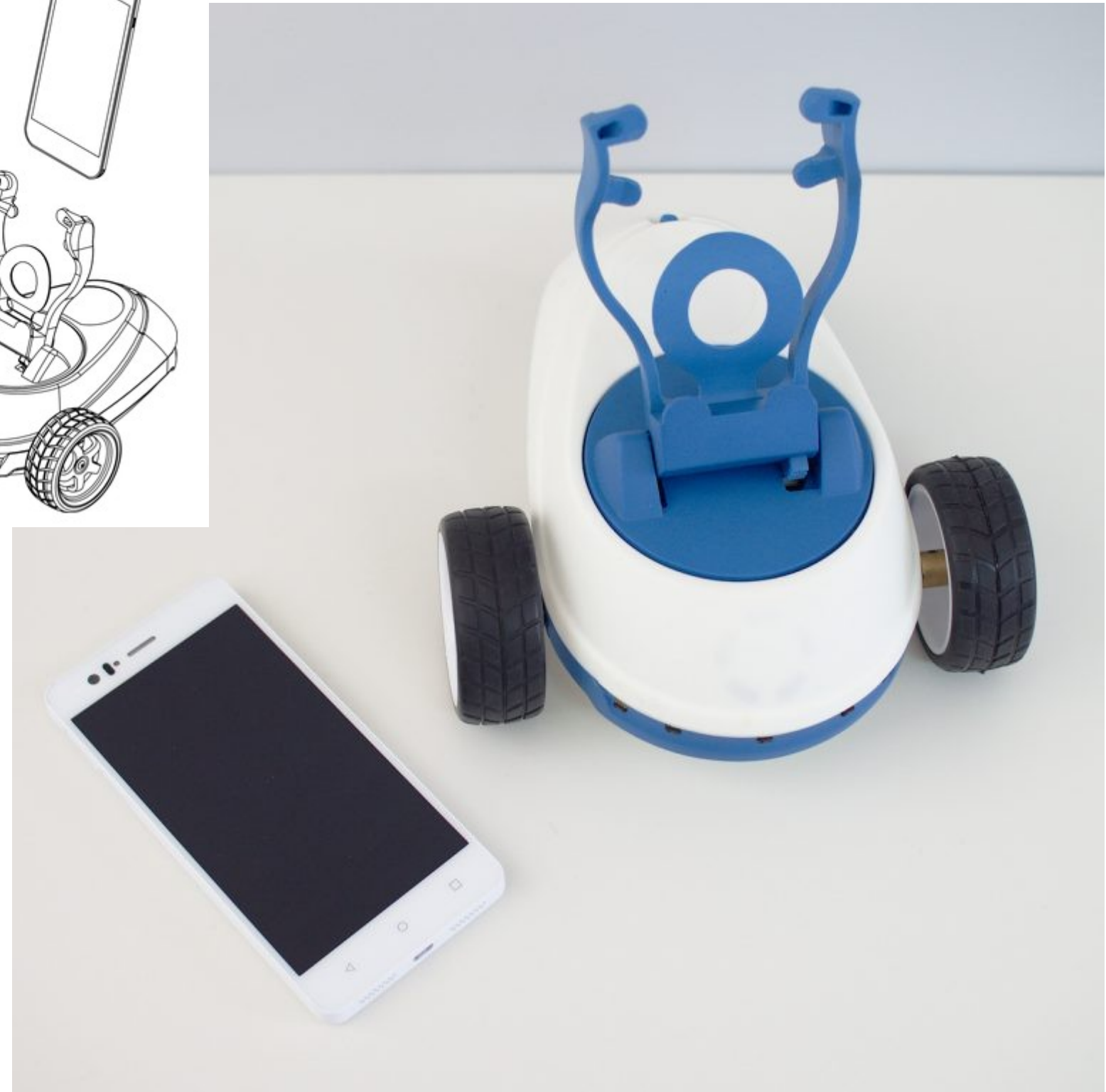
 No tienes dispositivos

 Añadir a la lista de deseos

Instalar



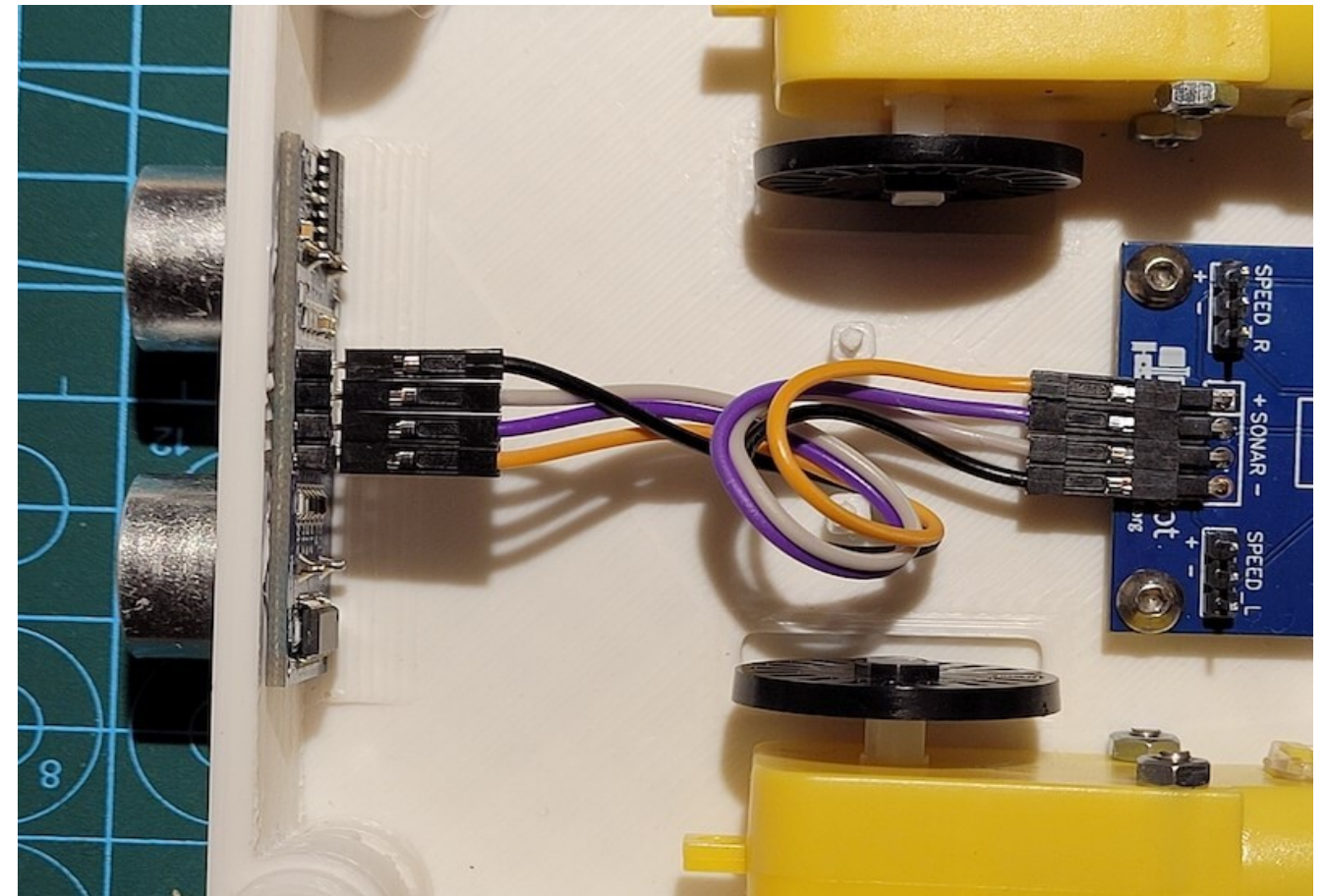
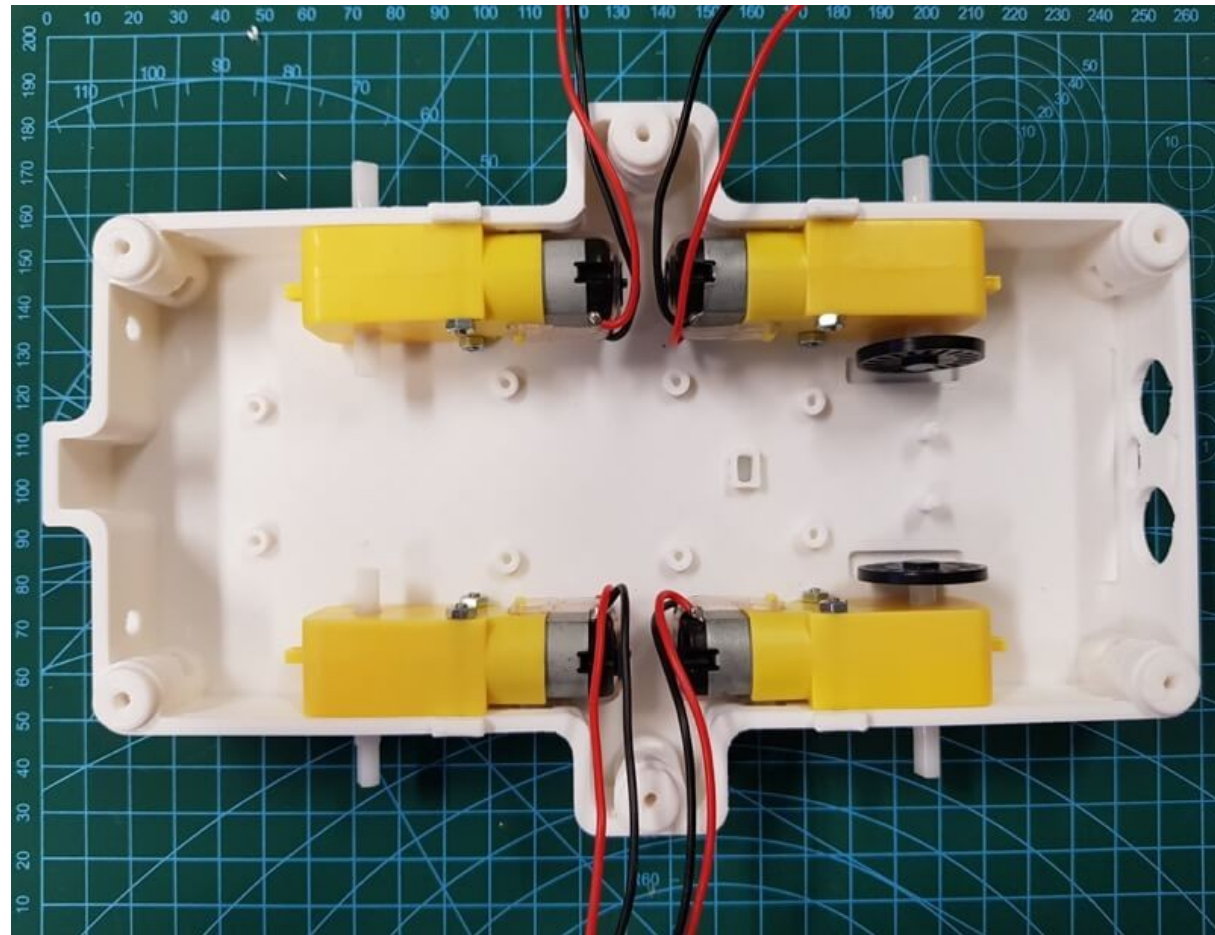
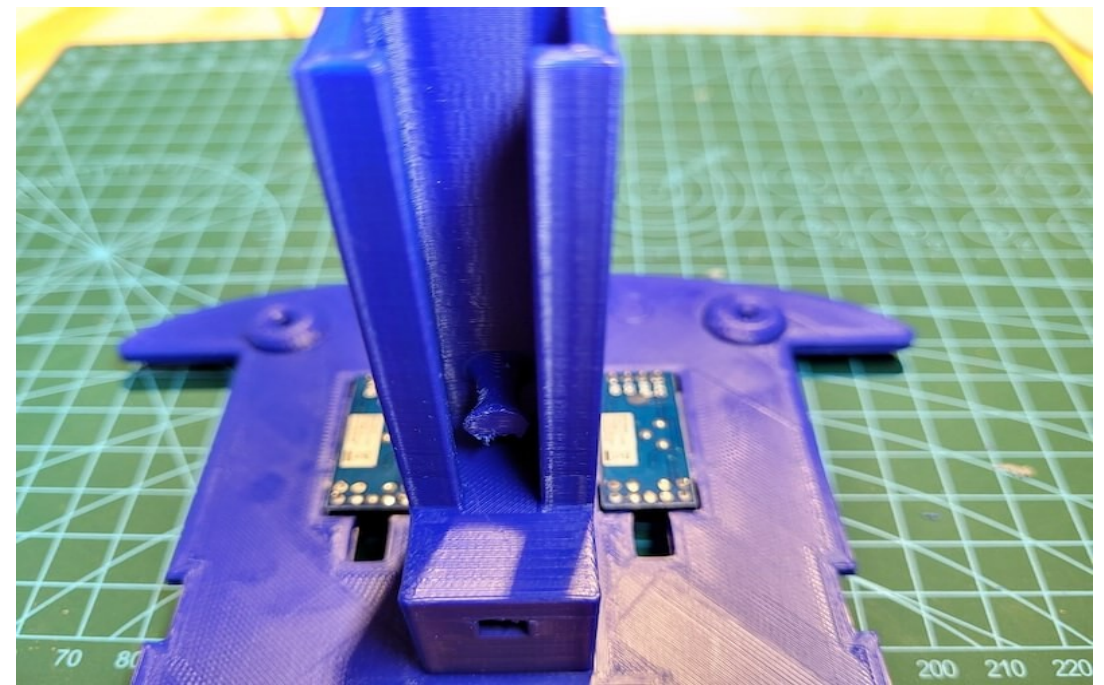
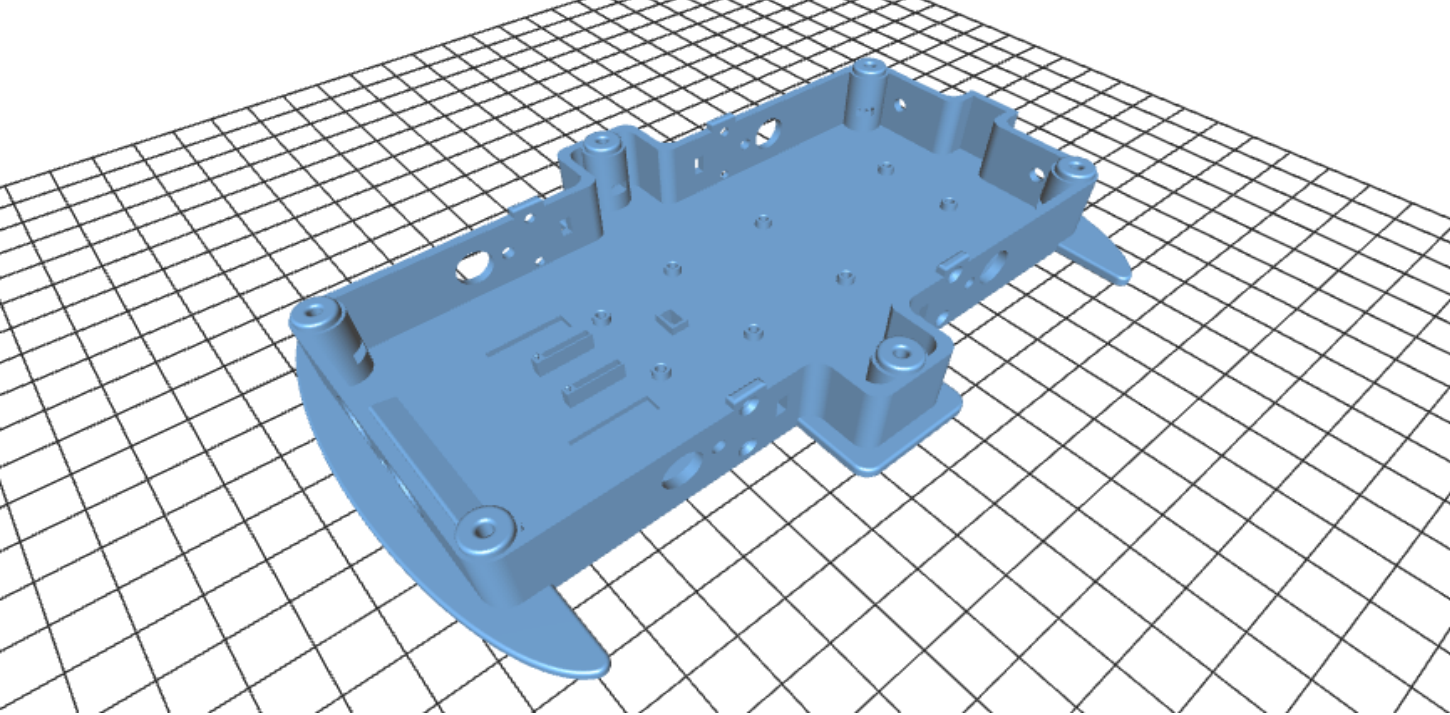
Esta aplicación permite programar el robot educativo Robobo desde Scratch.

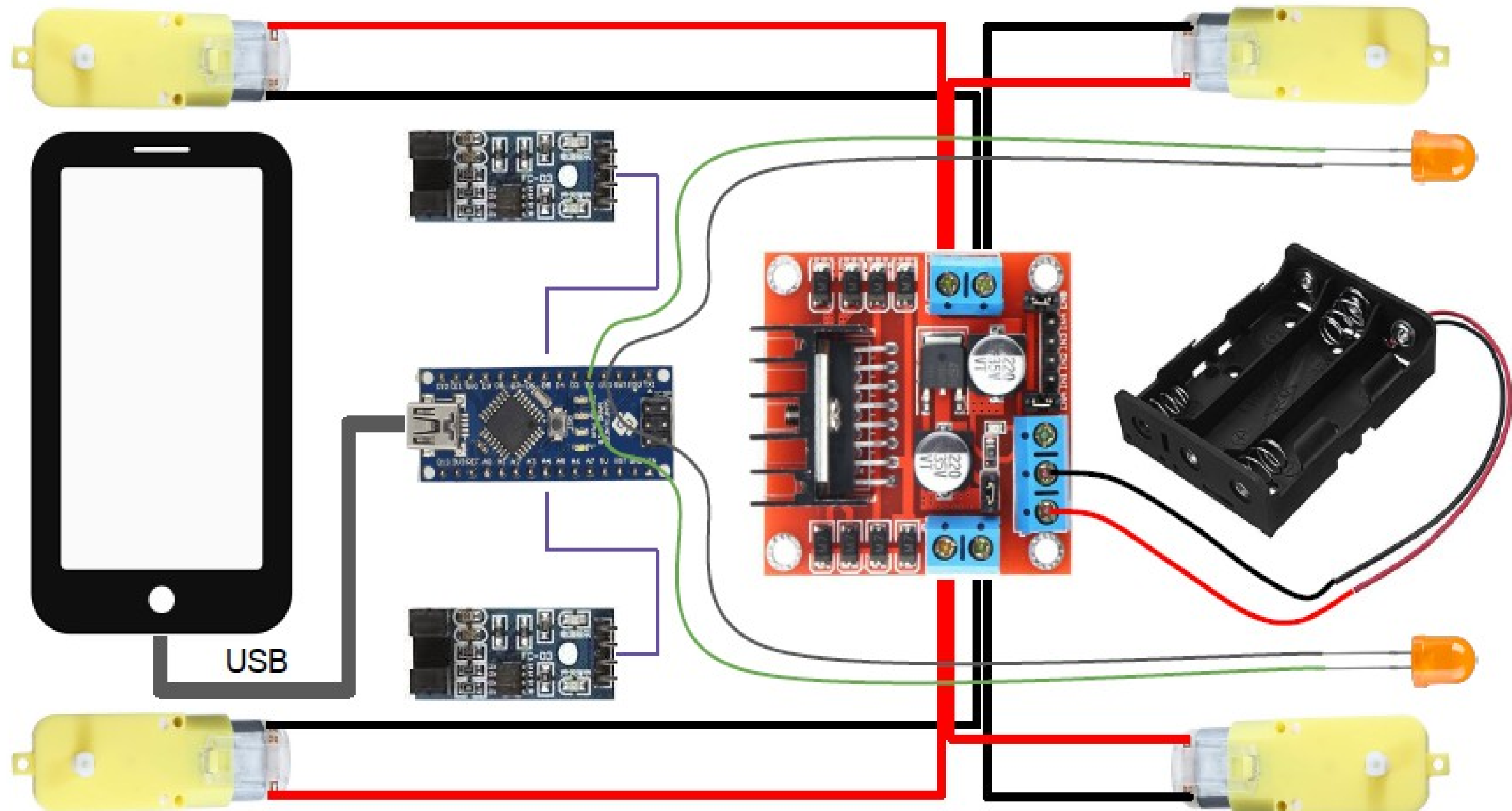


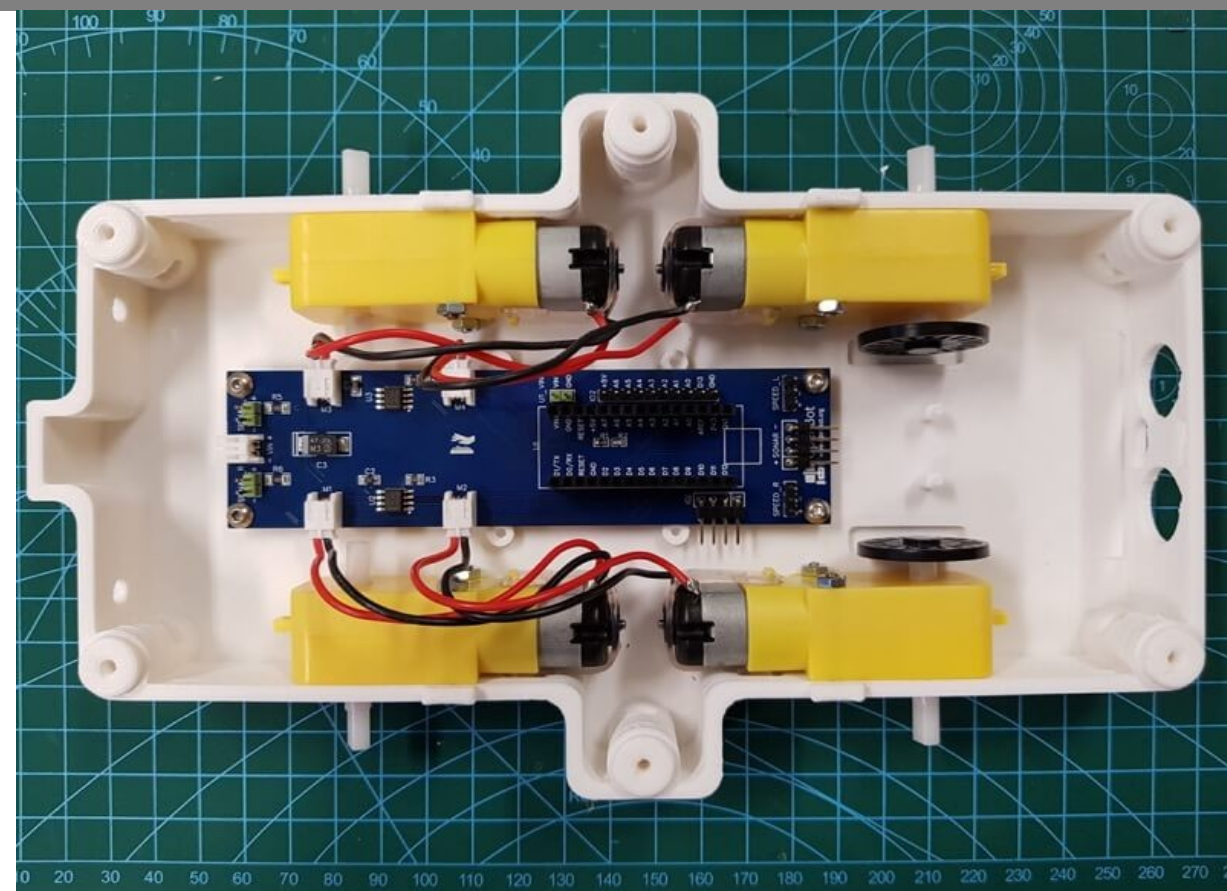
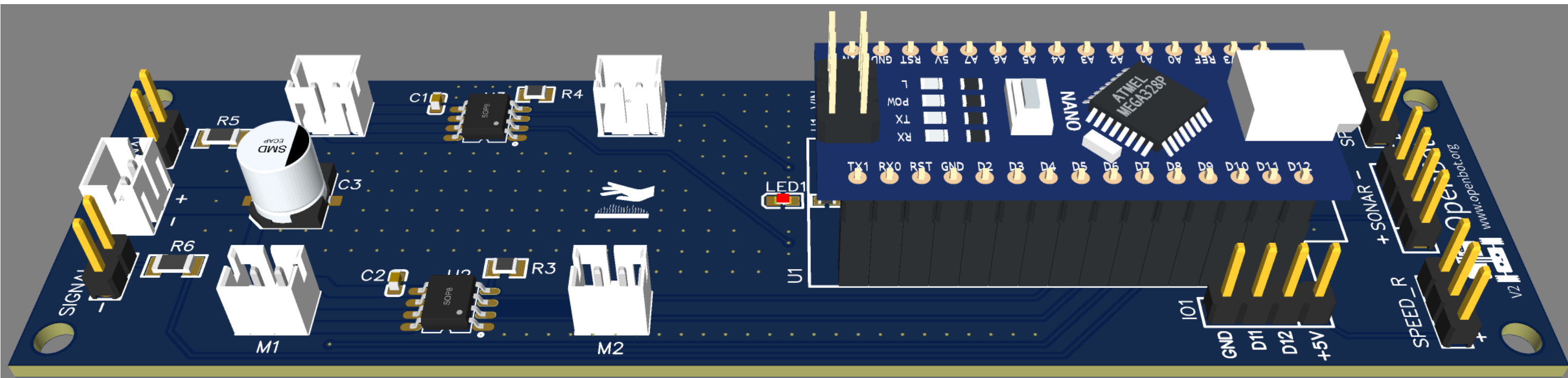


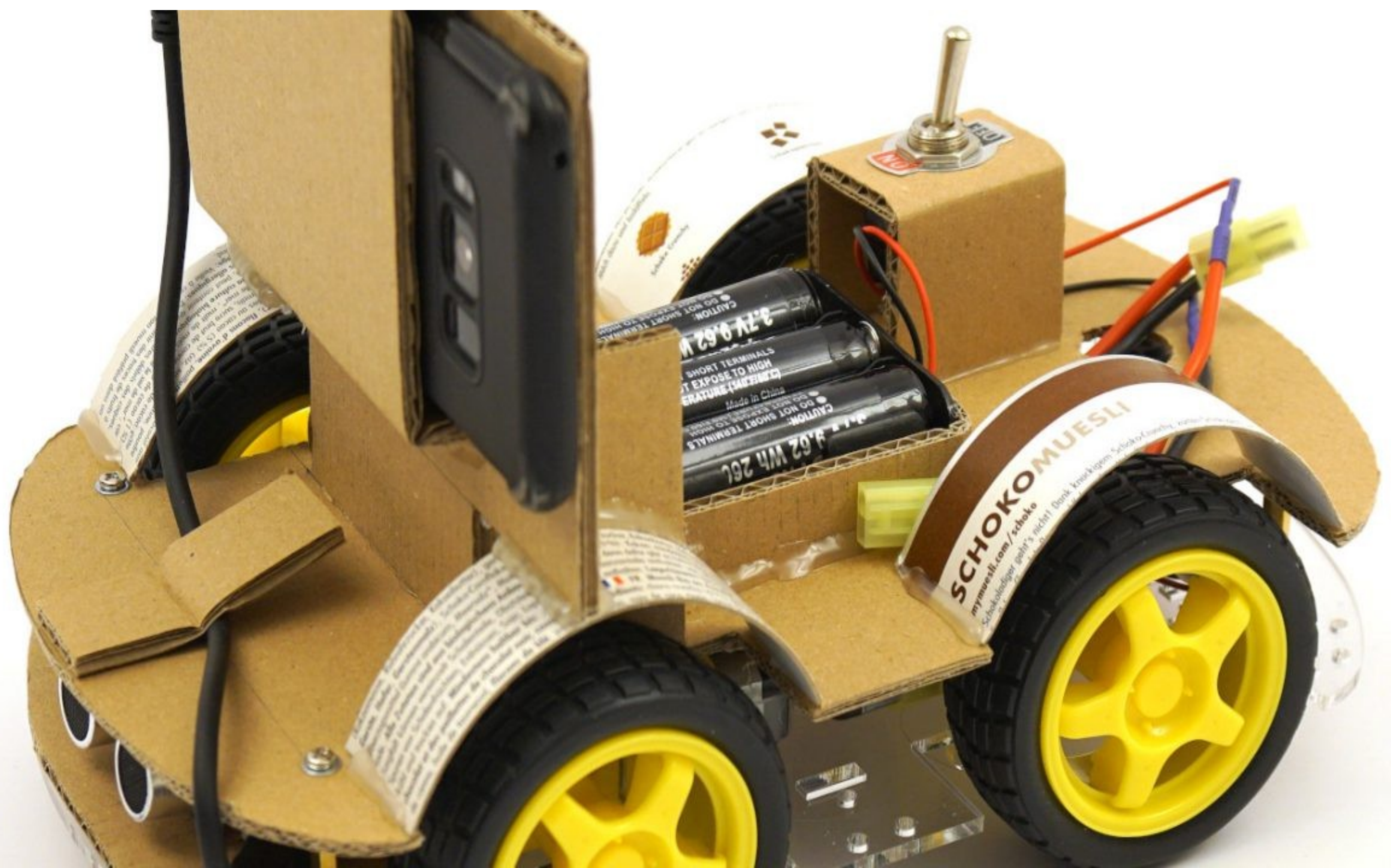
OpenBot

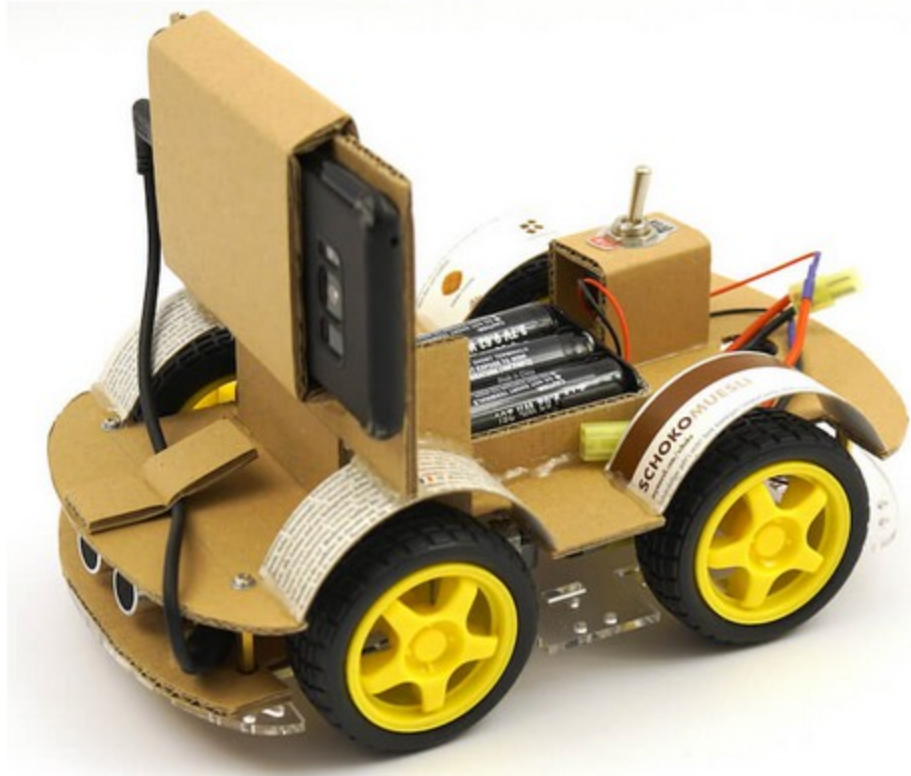


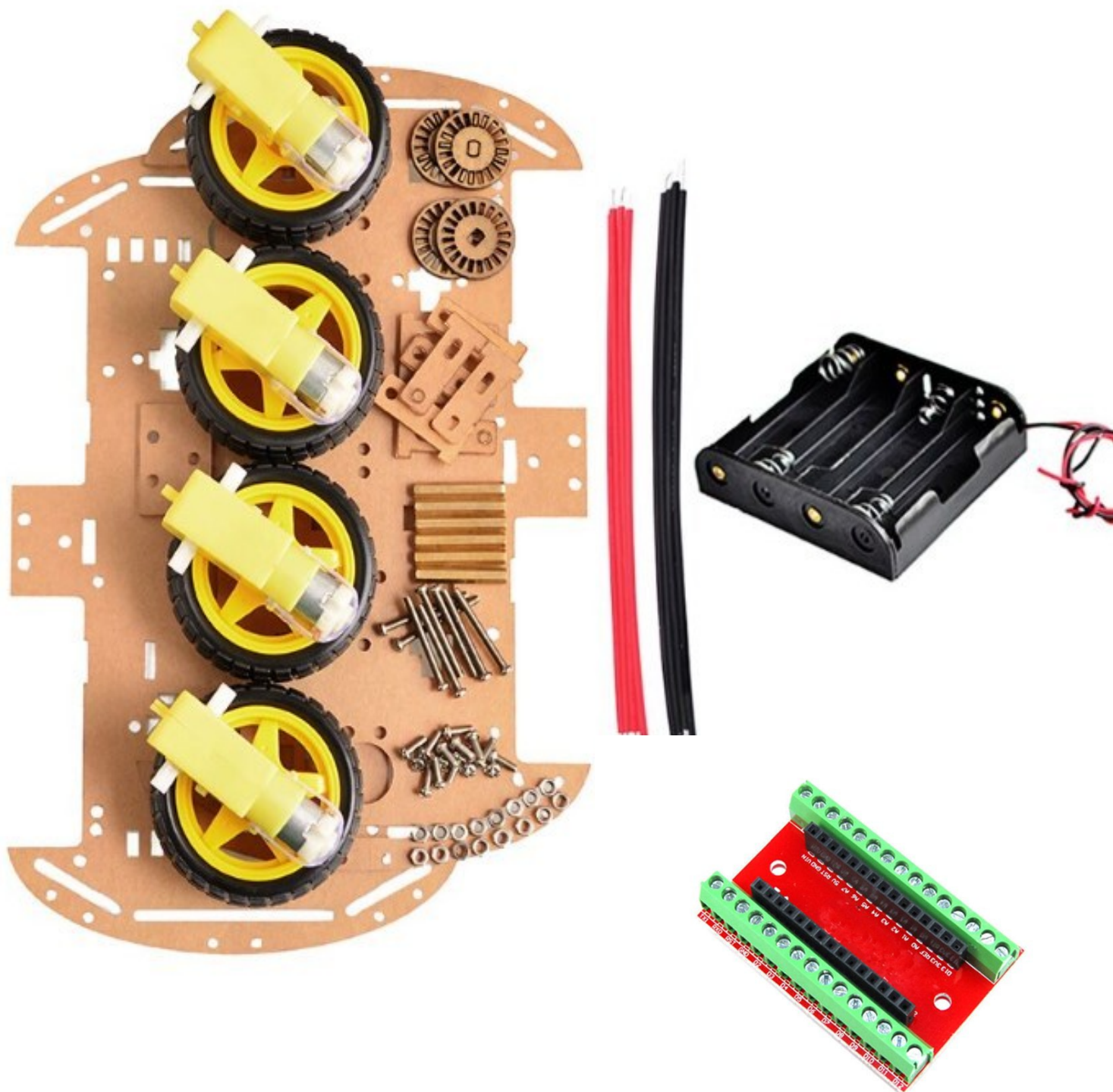




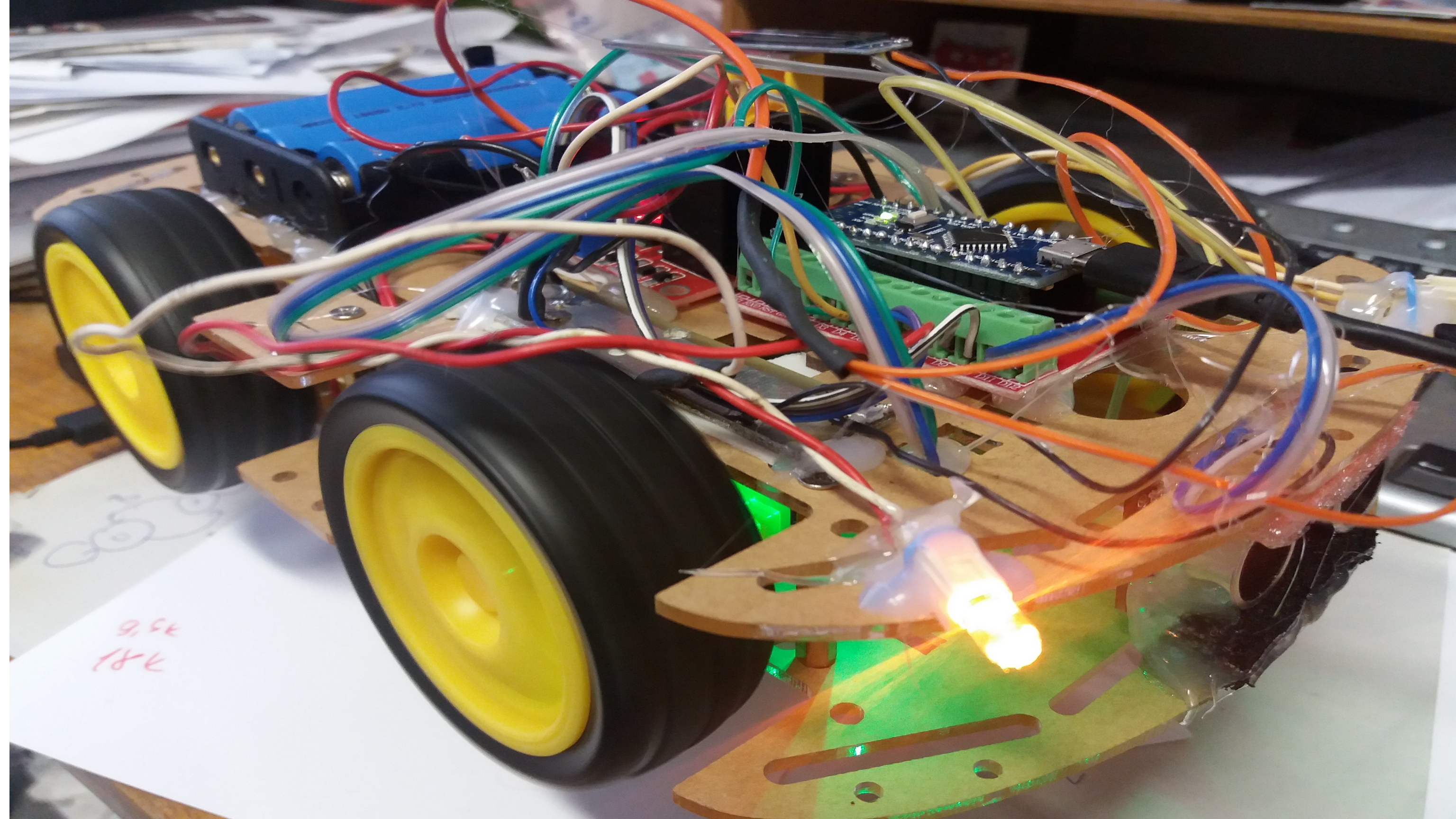








ks	Produkt	Cena spolu
Required components		
1x	Arduino Nano precízny klon	5,70 €
1x	Arduino Nano Terminal Adapter v1.0	3,60 €
1x	Stavebnica auta 4WD (4x motor, tires, screws + chassiss)	13,20 €
1x	Držiak pre tri 18650 Li-Ion batérie	1,20 €
3x	18650 Li-ion batéria 10C HIGH DISCHARGE 3.7V, 2000mAh	13,20 €
1x	Ovládací modul pre motorčeky dual H-bridge L298N	3,10 €
1x	On/Off páčkový prepínač	0,60 €
1x	USB OTG cable mikro USB -- mikro USB	8,90 €
1x	pružinka alebo gumička	
1x	prepojovacie káblíky	
		49,50 €
Optional components		
1x	HC-SR04 Ultrazvukový senzor vzdialenosti	1,90 €
2x	Optický bariérový modul, ambivalentný výstup	1,50 €
1x	I2C biely OLED displej 0.91" 128x32	8,27 €
2x	Orange LED 5mm	0,10 €
4x	Rezistory (2x 150Ω - LED, 20 kΩ + 10kΩ - the voltage divider)	1,90 €
		13,67 €
		63,17 €



```
// Enable/Disable voltage divider (1,0)
```

```
#define HAS_VOLTAGE_DIVIDER 0
```

```
// Enable/Disable indicators (1,0)
```

```
#define HAS_INDICATORS 0
```

```
// Enable/Disable speed sensors (1,0)
```

```
#define HAS_SPEED_SENSORS 0
```

```
// Enable/Disable sonar (1,0)
```

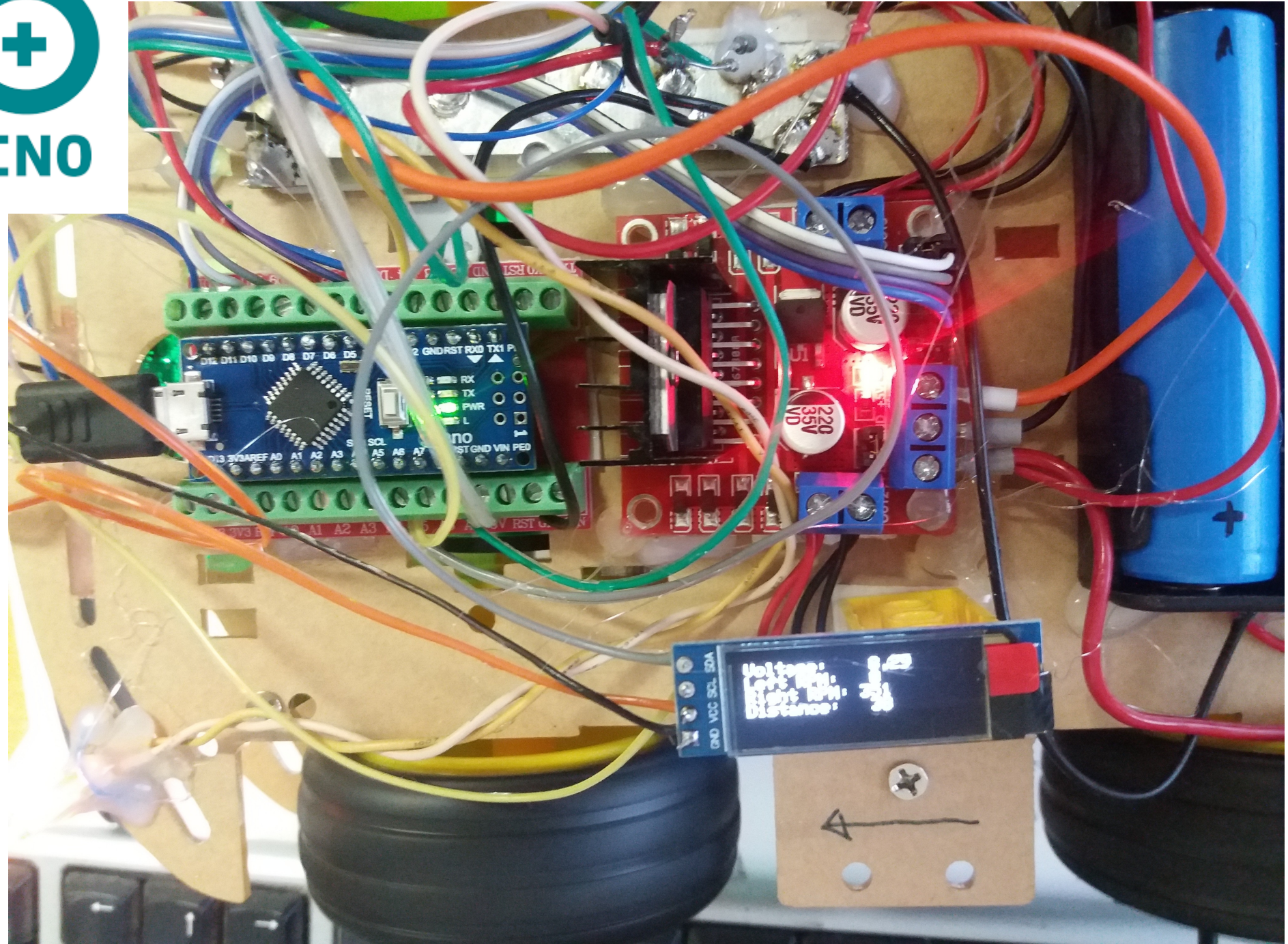
```
#define HAS_SONAR 0
```

```
// Enable/Disable median filter for sonar measurements (1,0)
```

```
#define USE_MEDIAN 0
```

```
// Enable/Disable OLED (1,0)
```

```
#define HAS_OLED 0
```



/dev/cu.wchusbserial1410

Send

20:38:37.597 -> **Napatie_baterie, rychlostL, rychlostP, ultrazvukovySenzor<CR><LF>**

20:38:38.601 ->

20:38:39.595 -> 10.67,120,105,88

20:38:40.605 -> 10.57,121,105,87

20:38:41.608 -> 10.64,121,106,86

20:38:42.608 -> 10.47,119,106,86

20:38:43.619 -> 10.49,119,107,87

20:38:44.617 -> 10.41,121,107,86

20:38:45.623 -> 10.45,121,107,87

20:38:46.629 -> 10.61,123,106,86

20:38:47.632 -> 10.52,122,107,87

20:38:48.596 -> 10.64,123,106,87

20:38:49.599 -> 10.51,124,107,86

20:38:50.600 -> 10.59,125,107,87

20:38:51.605 -> 10.43,125,107,86

☒ Autoscroll

☒ Show timestamp

Newline

115200 baud

Príkaz	
i1	ľavý blinker
i-1	pravý blinker
i0	vypni LEDky
c255,255	max. rýchlosť vpred
c-225,-255	max. rýchlosť vzad
c0,0	stop
c127,-127	otočka na mieste

Zdroje



Müller, Matthias, and Vladlen Koltun. "OpenBot: Turning Smartphones into Robots." arXiv preprint arXiv:2008.10631 (2020).



<https://www.openbot.org/>



Richard Balogh
balogh@elf.stuba.sk

Andrej Lúčny
lucny@fmph.uniba.sk

Opinion:

mobile? location also possible? possible



11. *Chlorophyll a* and *Chlorophyll b* content



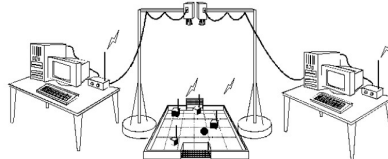
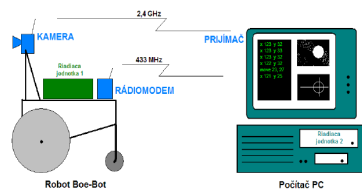
WIFI
WORKING

Čo je to robot?



https://en.wikipedia.org/wiki/Humanoid_robot#/media/File:Valkyrie-robot-3.jpg

Priestorová dislokácia mobilného robota



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- 2002
- \$900
- Windows 98



<https://www.semanticscholar.org/paper/Teaching-Robot-Localization-with-the-Evolution-ER-1-Dodds-Santana/bbf0f2bac88d61759c331e452e3d77c9caf1a813>

Parallax Eddie

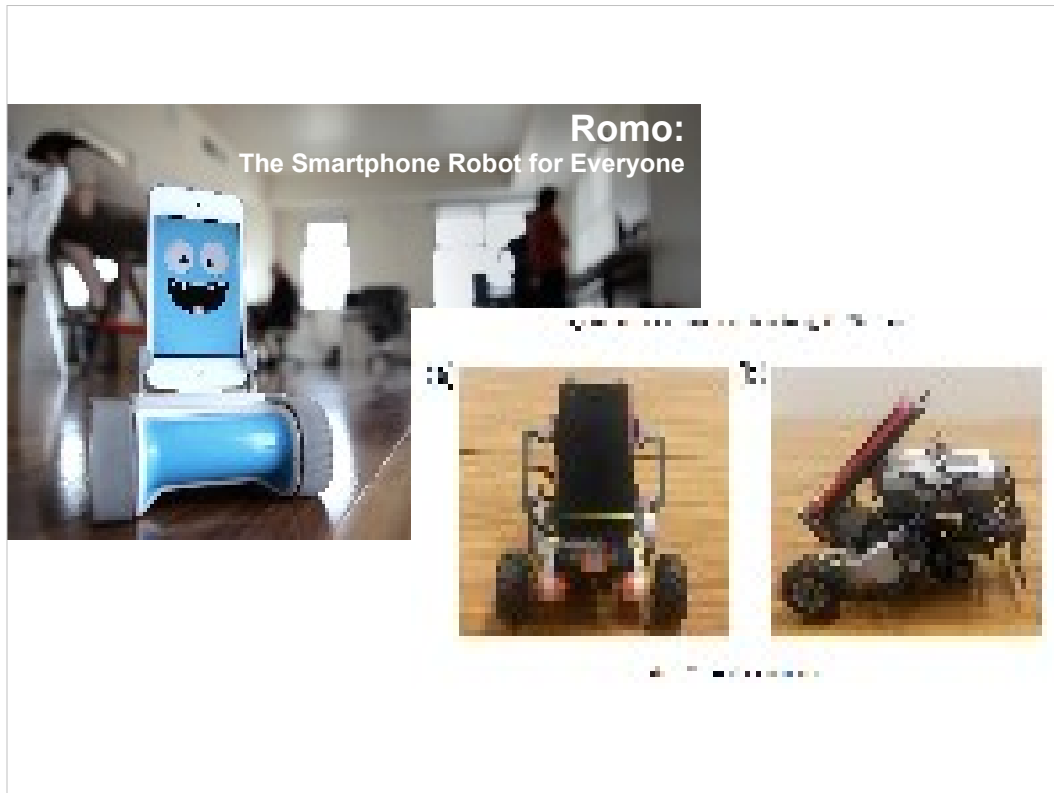


MIDbot

Calliope iRobot







```
@article{ONO201437,
title = "Personal Robot Using Android Smartphone",
journal = "Procedia Technology",
volume = "18",
pages = "37 - 41",
year = "2014",
note = "International workshop on Innovations in Information and Communication
Science and Technology, IICST 2014, 3-5 September 2014, Warsaw, Poland",
issn = "2212-0173",
doi = "https://doi.org/10.1016/j.protcy.2014.11.009",
url = "http://www.sciencedirect.com/science/article/pii/S2212017314005301",
author = "Koya Ono and Hitoshi Ogawa",
keywords = "Android smartphone, Personal robot, Face detection, Autonomous
behavior",
abstract = "Various kinds of services are offered by using smartphones.
Smartphones are usually carried throughout the day and are held by hand when
they are used. However, it is convenient that smartphones are close by when
they are necessary and do not need to carry them in other cases. In this
paper, a smartphone was connected to a personal robot, which approaches a
person when needed. Mindstorms NXT was adopted as an interface for a robot to
move. The actions of the robot were decided by a smartphone, and the movement
was ordered to Mindstorms NXT using Bluetooth connection. A camera on the
smartphone was used for the decision of the robot action. The effectiveness of
the personal robot was shown by experiment."
}
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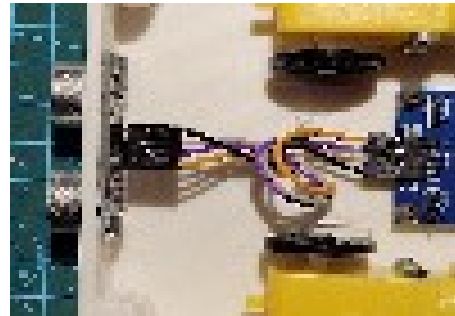
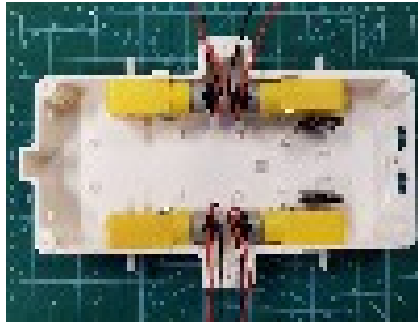
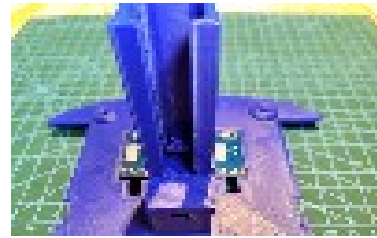
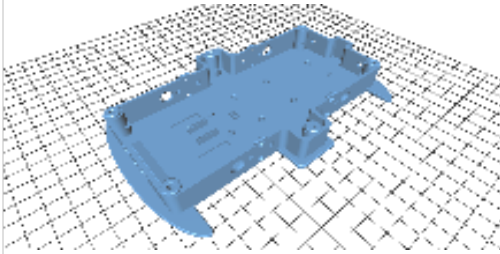
<https://www.kickstarter.com/projects/peterseid/romo-the-smartphone-robot-for-everyone>

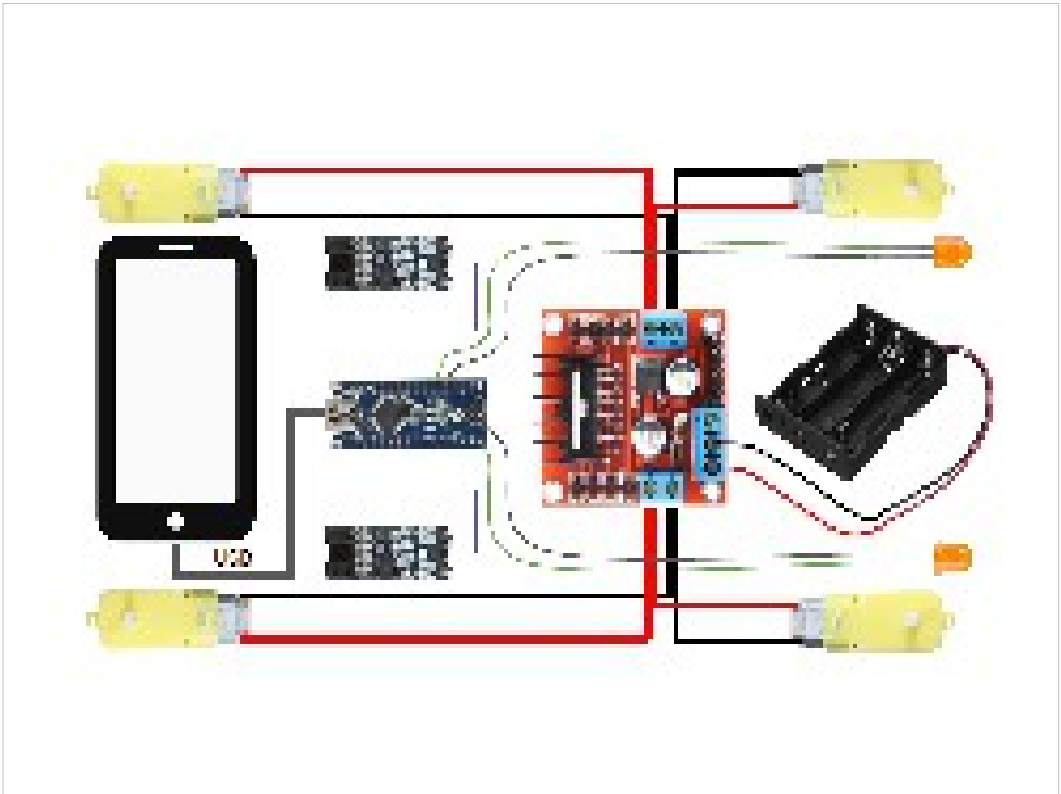


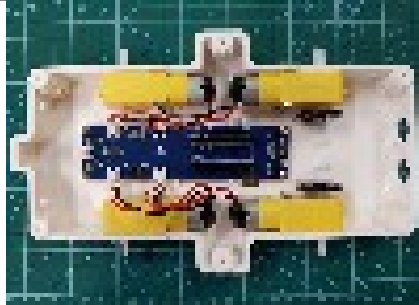
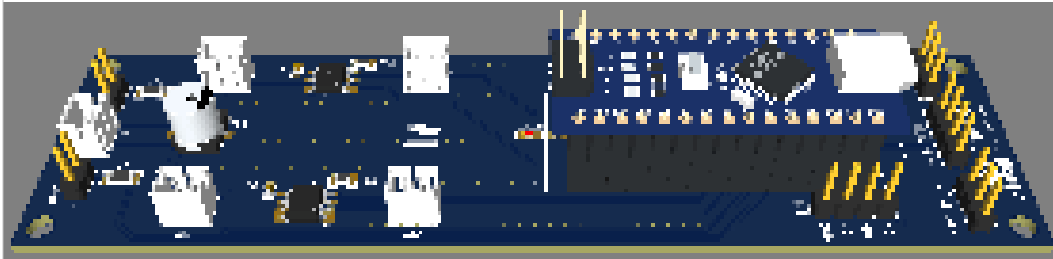
<https://theroboboproject.com/en/what-is-robobo/>

<https://education.theroboboproject.com/en/robobo-presentation>





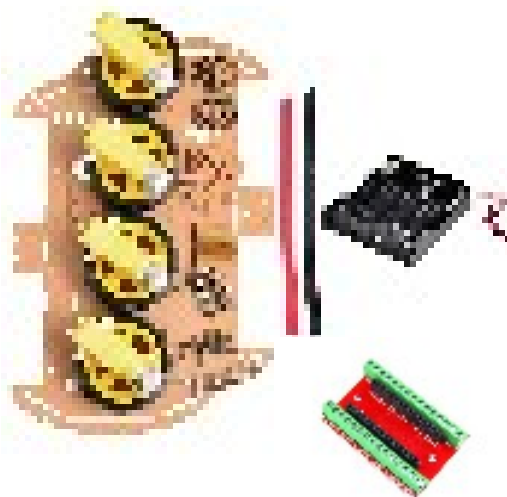






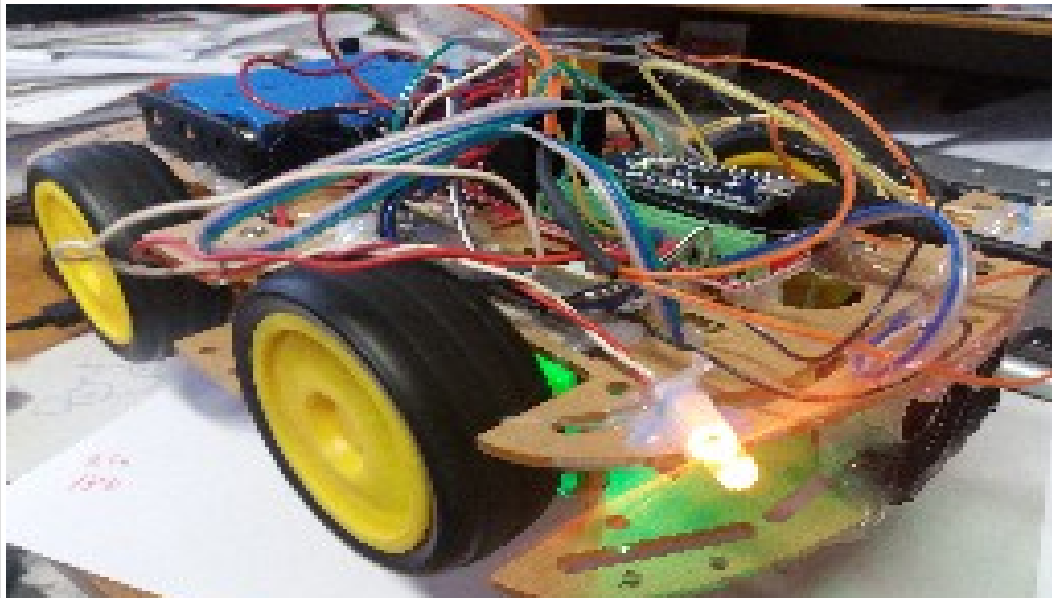
<https://custom-build-robots.com/raspberry-pi-robot-cars/openbot-your-smartphone-controls-a-robot-car-introduction/13860?lang=en>





Techfun.sk

Fr. 10.10.1	Fr. 10.10.2
Fr. 10.10.1.1	
1. 10.10.1.1.1	10.10.1.1.2
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5. 10.10.1.1.9	10.10.1.1.10
6. 10.10.1.1.11	10.10.1.1.12
7. 10.10.1.1.13	10.10.1.1.14
8. 10.10.1.1.15	10.10.1.1.16
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18. 10.10.1.1.35	10.10.1.1.36
19. 10.10.1.1.37	10.10.1.1.38
20. 10.10.1.1.39	10.10.1.1.40
21. 10.10.1.1.41	10.10.1.1.42
22. 10.10.1.1.43	10.10.1.1.44
23. 10.10.1.1.45	10.10.1.1.46
24. 10.10.1.1.47	10.10.1.1.48
25. 10.10.1.1.49	10.10.1.1.50
26. 10.10.1.1.51	10.10.1.1.52
27. 10.10.1.1.53	10.10.1.1.54
28. 10.10.1.1.55	10.10.1.1.56
29. 10.10.1.1.57	10.10.1.1.58
30. 10.10.1.1.59	10.10.1.1.60
31. 10.10.1.1.61	10.10.1.1.62
32. 10.10.1.1.63	10.10.1.1.64
33. 10.10.1.1.65	10.10.1.1.66
34. 10.10.1.1.67	10.10.1.1.68
35. 10.10	



```

// Enable/Disable voltage divider (1,0)
#define HAS_VOLTAGE_DIVIDER 0

// Enable/Disable indicators (1,0)
#define HAS_INDICATORS 0

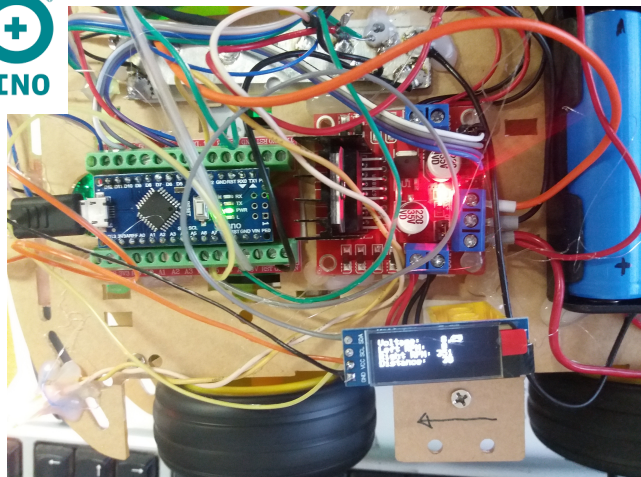
// Enable/Disable speed sensors (1,0)
#define HAS_SPEED_SENSORS 0

// Enable/Disable sonar (1,0)
#define HAS_SONAR 0

// Enable/Disable median filter for sonar measurements (1,0)
#define USE_MEDIAN 0

// Enable/Disable OLED (1,0)
#define HAS_OLED 0

```



Napajanie je trocha zvladne vyriesene - arduino je napajane cez USB kabel bud z Pc, alebo z mobilu, vsetko ostatne je na baterky, ktore sa zapnu vypinacom (je tam napisane kde je on/off). Takze ked pripojis Arduino k seriovej linke (ci uz na PC alebo na mobile), zacnu chodit 1x za sekundu styri cisla oddelene ciarkou:

Napatie je najprv nulove, kym nezapnes vypinacom baterky, rychlost je len ak sa tocia kolieska, pricom ty uvidis len jedno cislo, lebo druhy senzor tam nie je. Ultrazvukovy senzor je cislo v cm, ako daleko je k najblizsej prekazke. Ak ma nejaku poruchu, vracia 65535

Rychlost seriovej linky je 115 200 Baud.

Prikazy, ktore mozes po seriovej linke posielat su:

i1<CR><LF> (lavy blinker)

i-1<CR><LF> (pravý blinker)

i0<CR><LF> (vypni svetielka)

c255,255<CR><LF> (max rychlost vpred)

c-225,-255<CR><LF> (max rychlost vzad)

c0,0<CR><LF> (stop)

c127,-127<CR><LF> (otocka)

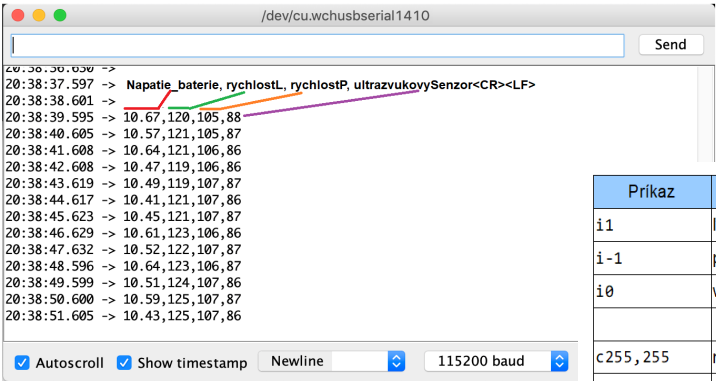
atd.

Ak som na nieco zabudol, je to tu

<https://github.com/intel-isl/OpenBot/tree/master/firmware>

Ty by si mal pokracovat tam, kde som ja skoncil a uz som nestihol:

<https://github.com/intel-isl/OpenBot/blob/master/android/README.md>

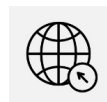


Príkaz	
i1	ľavý blinker
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c255,255	max. rýchlosť vpred
c-225,-255	max. rýchlosť vzad
c0,0	stop
c127,-127	otočka na mieste

Zdroje



Müller, Matthias, and Vladlen Koltun. "OpenBot: Turning Smartphones into Robots." arXiv preprint arXiv:2008.10631 (2020).



<https://www.openbot.org/>



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balogh@elf.stuba.sk

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lucny@fmph.uniba.sk