



Koło Mechatroniczno - Robotyczne

przy Zespole Szkół Technicznych w Grudziądzu

działalność wspierają:



Dane Adresowe:

Zespół Szkół Technicznych
Hoffmanna 1-7

86-300 Grudziądz, Poland

e-mail: robotyka@zst-grudziadz.pl

fb: KN Mechatroniczno Robotyczne

Zajęcia pozalekcyjne:

- Projektowanie i wydruk 3D
- Budowa autonomicznych pojazdów miniSumo
- Budowa konstrukcji robotycznych Freestyle

- Programowanie sterowników
- Programowanie Arduino i Android
- Wyjazdy na turnieje i targi

Class robot construction report

miniSUMO

Dawid Ziórkowski 4TM-2019

MiniSUMO robot

At the outset, it should be explained what the

There is this type miniSUMO competition

competitions between autonomous robots with a

maximum weight of 500g and dimensions up to

100x100mm. They are placed in the arena, their

purpose is to locate, attack and push them off the opponent's m

It is very important not to limit yourself to proven

solutions, but to experiment.

An excellent example of departing from the usual

patterns will be the example of the Mechatron robot

created by me. Every constructor must have an idea.

My idea was to create a very fast robot.

Of course, we start the process of creating a Mini

sumo robot with an idea. Then we have to look for

parts, check their compatibility, complete the order

and start submitting.

Motors

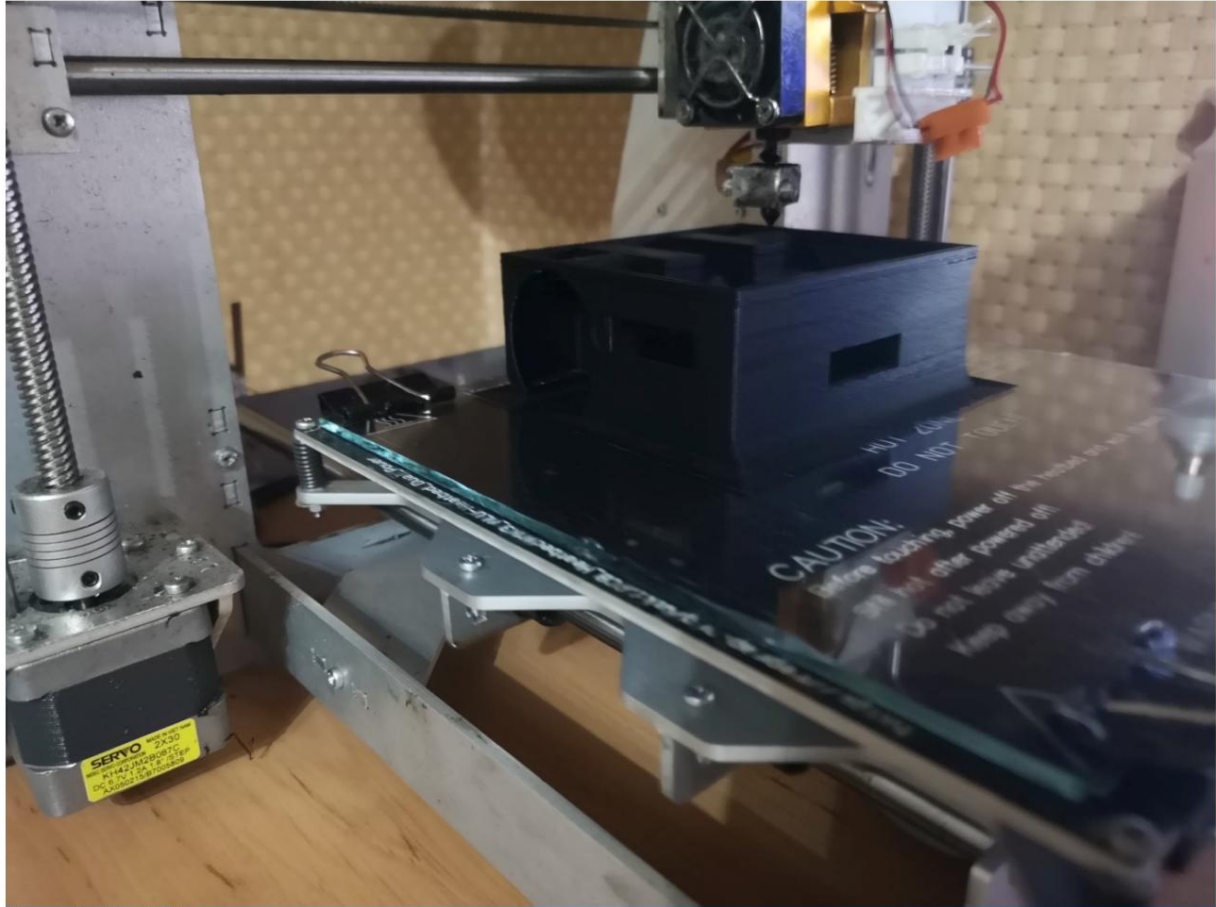
As I mentioned in my case, I decided to create a very fast robot. I chose engines that run on 6V and have over 10,000 rpm. There will be two such engines in the robot. With the right size of the wheels, they allow it to accelerate to over 75 km / h.

Case

The housing is designed in AutodeskFusion 360 and made on a 3D printer (Prusa i3) made of PLA filament. This method allows us to make the housing with great accuracy and aesthetics, because when making the housing of other materials, it is difficult to make elements such as wheel arches or perfect holes for sensors. You should also not forget about a properly profiled plow, thanks to which we will be able to pry our

him

opponent and pus



2 Repetier-Host V2.1.3 - zielék kód v7

Plik Widok Konfiguracja Drukarka Server Narzędzia Pomoc

Odłącz Otwórz Przerwij Zabij Log

Widok 3D Wykresy temperatur

Ustawienia drukarki Easy Mode Awaryjne

Polozenie obiektu Slicer Print Preview Edytor G-Code Kontrole

ETE 1h:26m:48s

G-Code: [input field]

X: 49,39 Y: 173,24 Z: 37,90

[Navigation buttons: Home, X, Y, Z, Rotate]

[Control buttons: Power, Pause, 1, 2, 3, 4, 5]

Prędkość drukowania [slider]

Wentylator [slider]

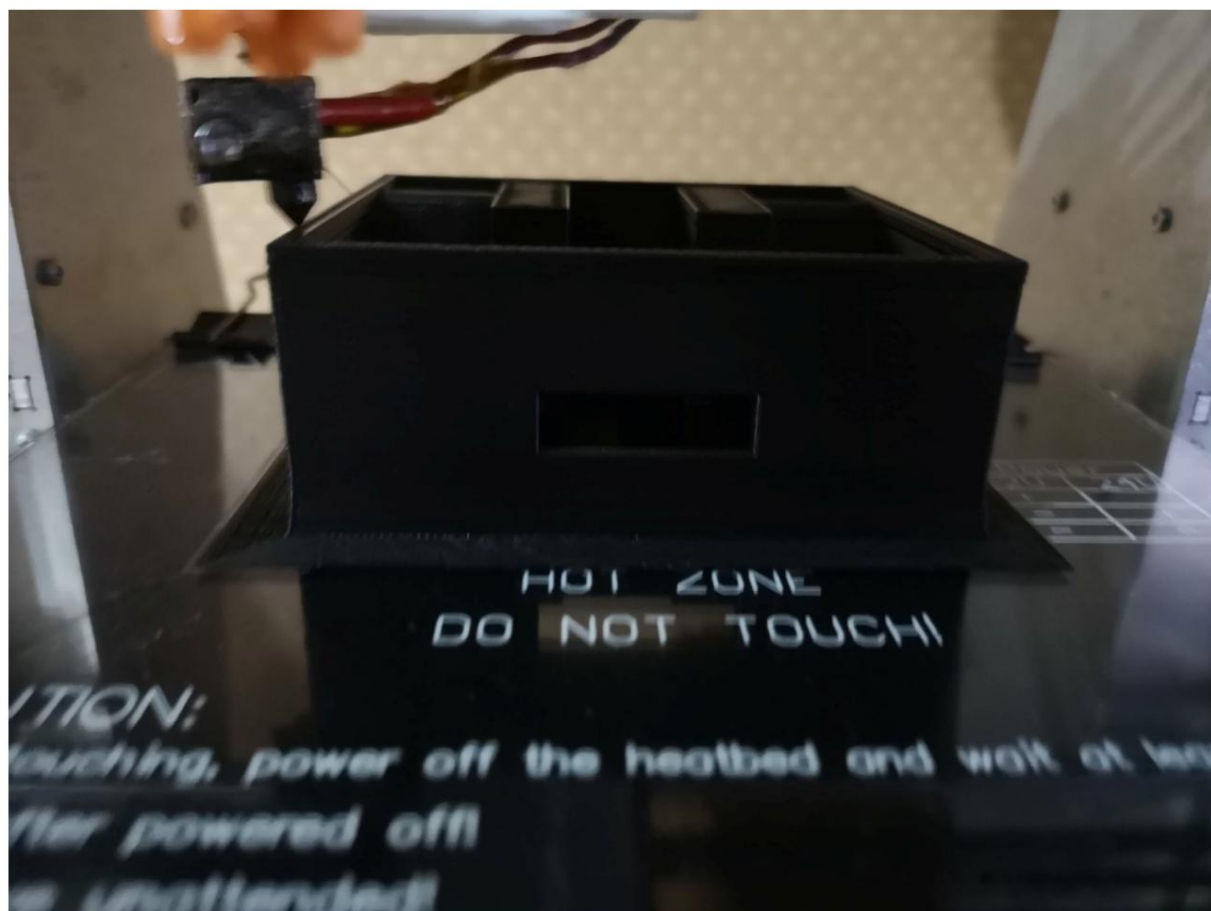
Ekstruder 1 - 206,30°C [slider]

Pokazuj w logu: Komendy Informacje Ostrzeżenia Błędy ACK Autoprzewijanie Wyczyść log Kopij

23:54:56.969 Drukuję warstwę 188 z 260
23:56:21.133 Drukuję warstwę 189 z 260

Podłączony: default Ekstruder: 206,3/205°C Printing...ETE 1h:26m:48s Warstwa 189/260





Sensors

In mini sumo robots, we use digital or analog sensors to detect the opponent and ground sensors that we place in such a way that they detect the white line around the ring, preventing the robot from following it. I use 4 sharp analog sensors with a range of 10cm-80cm in my robot. I decided to give up the ground sensors because the robot, even if it noticed a white line, would not have time to brake.

Power

Redox Li-Pol package 700mAh, 7.4v It perfectly meets our requirements in terms of parameters and size. During the competition, I use 4 such packages charged to 8.4 V each and, if necessary, I also charge them with a dedicated charger.

Tires

I make a mold in 3D printing and aluminum technology, and I cast tires from molding silicone. If we additionally clean them with an acetone-based agent before the fight, we have a guaranteed great adhesion.



Control

To avoid too many wire connections, I etched the laminate board. Then I connected everything with the arduino-nano and the appropriate motor driver.

Program

The last but also very important element is writing and uploading an arduino program. This will allow the robot to perform an appropriate response to a given stimulus, e.g. the robot will rotate until the analog sensor sees the opponent. Building a robot

based on Arduino, I recommend for more advanced users, and for beginners, a very good option is to use the Sims tile, which each team registered for Robot Wars on UTP in Bydgoszcz receives. In the Sims board, we create a program in a block diagram and it is an easier option and we already have a built-in engine driver.