



Jumping Robot



Basement Creations

VIEW IN BROWSER

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Summary

Video about this robot <https://youtu.be/RuMLHJW1teM> Last year I designed a spring powered jump mechanism and now I am...

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Tags: [springloaded](#) [arduino](#) [arduinorobot](#) [jumping](#) [rcrobot](#)
[jumpingsumo](#) [jumpingrobot](#)

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Last year I designed a spring powered jump mechanism and now I am back with a whole jumping robot. Its main part is servo powered spring compression mechanism which uses herringbone gearbox to increase the torque needed to fully compress two ASG springs. After testing the mechanism I added two motors, flexible wheels printed from PETG and an Arduino RC control circuit which gives it the ability to move like a normal robot and jump when it needs to. To power the whole robot I used a small 2S drone battery and I wouldn't recommend using lower voltages because the servo might not be able to fully compress the springs.

Overall this robot was a lot of fun to work on because I always wanted to have one of those Jumping Sumo mini drones and since I never got one, I built it myself. However it is still far from perfect and there is a lot of space for improvements. For example it would be better to print wheels from

elastic filament like TPU, it should be at least 50g lighter (It weighs around 340g), the main frame should include space for electronic components and it would also be cool to add a small fpv camera to it. Furthermore in my Arduino circuit I used 5V Arduino Pro Mini and RC receiver but now when I think about it it might be better to use the 3.3v Arduino version and NRF24 which would take less space and give more steering options. Maybe I will make another video about those upgrades in the future but for now it works which is kind of surprising since it is my creation. And to achieve higher jumps it's better to ride on hard surfaces because I noticed that grass dampens the jump power a little bit but it's still good enough to jump on or over small obstacles.

If you decide to make this robot go watch my video for some instructions. There are also .step and .f3d files here so feel free to remix it as you will. And if you somehow manage to upgrade it, don't hesitate to share because I think that this is the first 3D printed project of that type of robot and it would be nice to make it better so that everyone can build it and later enjoy the results.

Parts list:

- ASG Springs 2x (I used M85)

- N20 75:1 Motors 2x (Gear ratio in those is a little bit too low, they need more torque)

- Small 2S LiPo battery 1x (I used 800mah but you can use smaller)

- Arduino Pro Mini 1x

- RC Transmitter and Receiver 1x

- Small relay 1x

- Small dual channel motor driver 1x (I used HG7881 but I don't really like this driver)

- Servo MG946R 1x

- Pieces of inner tube or some other rubber

- Some screws

- Tape

- 6x208mm Aluminium Pipe 2x

- 6x82mm Aluminium Pipe 1x

- 5x63mm Aluminium Rod 2x

-5x16mm Aluminium Rod 1x

-5x41mm Aluminium Rod 2x

-3x18mm Steel Rod 1x

-3x62mm Steel Rod 1x

Parts to print:

-Frame V2 1x

-Back 1x

-Rack 1x

-Main Gear 1x

-Second Gear 1x

-Wheel1 1x

-Wheel2 1x

-Motor Gear 2x

-Servo Gear 2x

-Brake 2x

-Wheel Spacer 2x

-Spring Tensioner x4

Arduino code and connections diagram that I used in my video can be downloaded as a zip file

If you have any questions feel free to ask me here, on my Youtube channel or via email basementcreationsemail@gmail.com . I am always glad to help someone

Print Settings

Printer Brand:

Creality

Printer:

Ender 3

Rafts:

No

Supports:

Yes

Resolution:

200

Infill:

10% Honeycomb

Filament: PlastSpaw PLA and PETG

Black

Category: Hobby

Model files



frame_v2.stl



brake.stl



jumping_robot_version_2.f3d



rack.stl



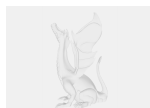
back.stl



servo_gear.stl



motor_gear.stl



jumping_robot_v2.step



wheel_2.stl



main_gear.stl



spring_tensioner_2.stl



second_gear.stl



wheel_1.stl



wheel_spacer.stl



spring_tensioner_1.stl

Other files



jumping_robot_arduino_code.ino

[Find source .stl files on Thingiverse.com](#)

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