

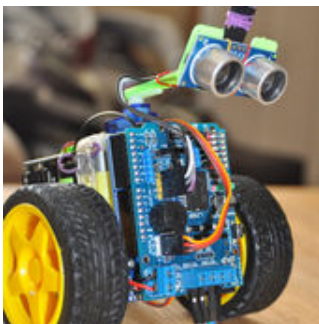


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SCRUFEE: Simple C++ Robot with Ultra-sonic Sensor for Education: Arduino UNO Obstacle Avoidance Maze Programming

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S.C.R.U.-F.E.: Simple C++ Robot with Ultrasonic-sensor for Education

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Description

S.C.R.U.-F.E.: Simple C++ Robot with Ultrasonic-sensor for Earthlings :)

SUPER FAST Simple 3D Printed Arduino Robot - SCRUFEE - Ultra...



I plan on using this design to promote the need for a realistic way to teach elementary and middle school students how programming can be simple and fun without the need for expensive kits. Please share/print/code and keep the resources flowing for education!

This Robot build started when my two year old daughter fell in love with an old ultrasonic robot that I built in elementary school twenty five years ago. It's missing parts and no longer works, but she has treated it with love since she was one year old. For her third birthday, I set out to make a sub \$50 Robot with easily replaceable parts (see B.O.M. in instructions) that we could make together. The fact that no individual part costs more than \$10 and that all parts are easily found or open source gives me the hopes that SCRUF-FE will be passed down to her children with all her great memories.

My daughter adores this Robot. She named him Scruffy, so I made up a silly acronym that fits his silly appearance.

Materials and methods

Bill Of Materials

- Printed Body
- Printed Servo Arm
- Printed Sensor Mount
- (2) Printed Wheel Halves

- Arduino UNO
- UNO Motor shield (I use the L298P with buzzer, Ping and servo inputs)
- Two "Smart Car" Gearmotors and wheels
- Two 3AA Battery holders
- SG-90 9g Micro servo set
- HC-SR04 Ultrasonic sensor
- 200mm female/female 4 pin cable
- High Amperage toggle switch (15A or better still looking for a good source can skip and take a battery out to shut the power off I burnt through a few 5A switches already :)
- (4) 25mm sections of wire for motors

- (2) F623 bearings (wheel)
- (4) M3x25mm socket cap screw (motors)
- (1) M3x15mm socket cap screw (neck)
- (1) M3x20mm socket cap screw (wheel)
- (4) M3x8mm flat head socket cap screw --(batteries)
- (4) M3x6mm socket cap screw (UNO)
- (6) M3 washers (wheel)
- (10) M3 nylon locking nuts
- several small rubber bands

optional: (3) 12mm long M3 coupler nuts to make internal assembly easier (replaces 6 m3 locking nuts, (4) 12mm (6mm threaded) m3 standoff nuts for the arduino board to give it a more professional look

Tools Needed:

- 2mm allen key
- 2.5mm allen key
- 2-3mm phillips screwdriver
- 2-3mm slotted screwdriver
- 5.5mm wrench
- small needle nose pliers
- tweezers (ESD-15 if possible)
- Soldering iron with small tip and solder
- small drill
- 1.5mm or 1/6" drill bit
- 3mm or 1/8" drill bit
- drill bit for chosen toggle switch

Building tips:

After printing the body drill out all holes with a 3mm drill bit except for the UNO mounting holes. On my prints the

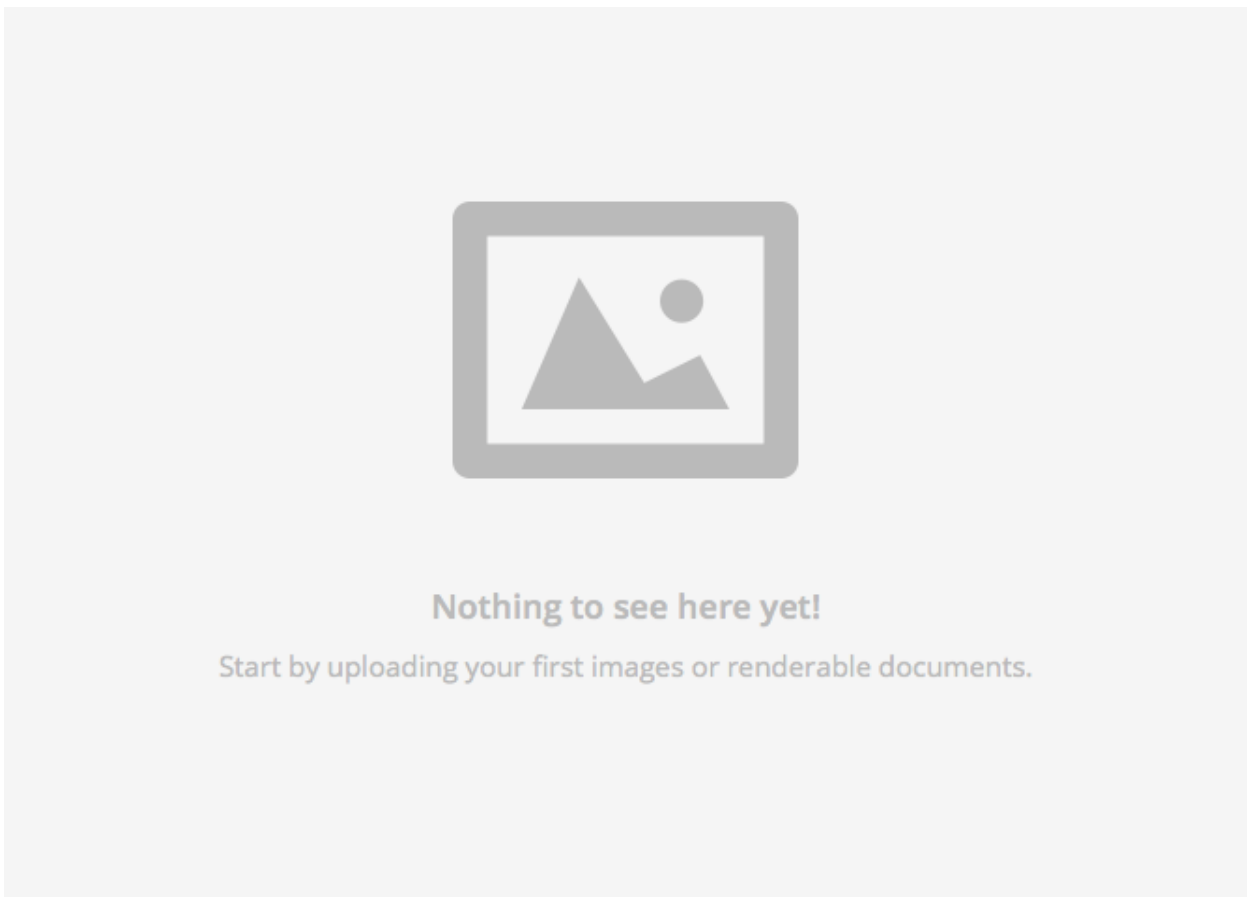
M3x6mm bolts self threaded in to the plastic itself. If this doesn't work, use 8mm bolts and nylon locking nuts instead.

The wheels need 3 washers or 2mm spacers on either side to allow for clearance from the lock nuts that hold the battery box on. If there is not enough clearance you can use a regular M3 nuts for the battery box or add more washers between the wheel and the body.

Code: the sample code included is a quick working code, however I am no master at C++ nor Arduino so please use it as an example only.

Documents

- 



Scru F Ecodebyryantheisof Z Extrude

TXT – 3.1 kb

Version 1 - Apr 20, 2015

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Scru F Erace Mode Code

TXT – 4 kb

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Scru F Ev1 U Smount

STL – 38 kb

Version 1 - Apr 01, 2016

Updated on 01-04-2016 – 0:19 h – 2 g – 46×22×8 mm

- [Edit in 3dslash](#)
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Scru F Ev1body

STL – 120 kb

Version 1 - Apr 01, 2016

Updated on 01-04-2016 – 2:31 h – 16 g – 56×60×92 mm

- [Edit in 3dslash](#)
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Scru F Ev1servo Extender

STL – 53 kb

Version 1 - Apr 01, 2016

Updated on 01-04-2016 – 0:16 h – 1 g – 59×14×9 mm

- [Edit in 3dslash](#)
- [Version 1 - April 01, 2016 13:04](#)

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Scru F Ev1servo Extender2

STL – 98 kb

Version 1 - Apr 01, 2016

Updated on 01-04-2016 – 0:17 h – 1 g – 59×14×9 mm

- [Edit in 3dslash](#)
- [Version 1 - April 01, 2016 13:04](#)

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Scru F Ev1wheel Half

STL – 53 kb

Version 1 - Apr 01, 2016

Updated on 01-04-2016 – 0:16 h – 2 g – 60×60×3 mm

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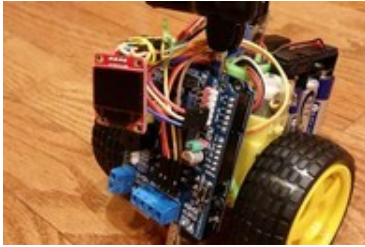


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Result:

Easy to print

Feedback:

Mockup for Bluetooth and IP Camera



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