

How to Build a NodeRover

Parts

Let's check that you have all the parts you'll need in the kit:



Kit box



Parts tray with
9V battery,
screwdriver set,
ultrasonic sensor,
3D printed sensor mount,
photoresistor,
10K resistor,
temperature sensor,
3D printed wheels (2 front and 2 rear),
battery clip cable,
3 x M3 nuts and bolts,
2 fibre washers,
female-female jumper cables,
Arduino Uno



3D printed axle,
laser cut baseplate,
sticker sheet



2 x continuous rotation servos



Cable ties,
silicone tracks



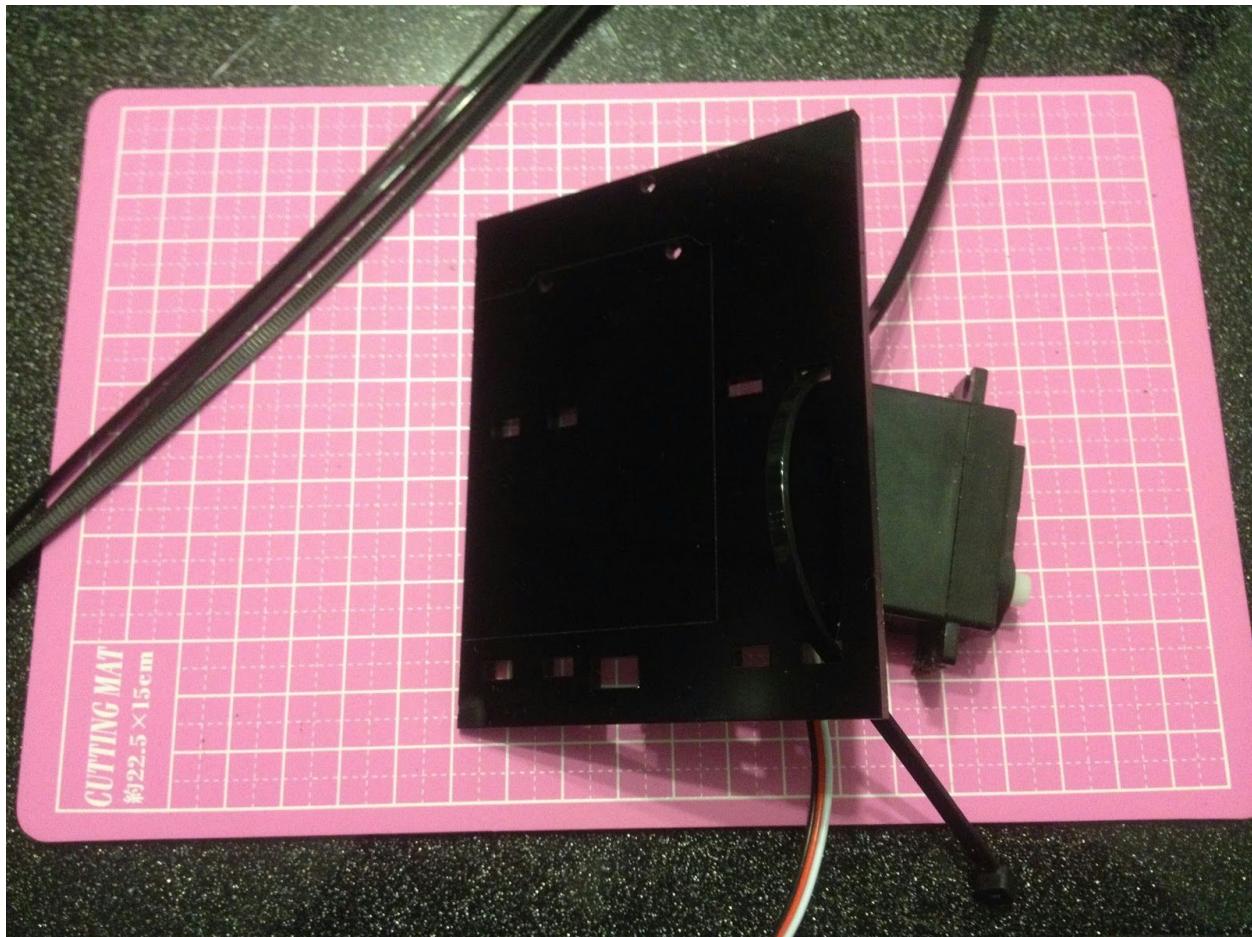
Long USB cable



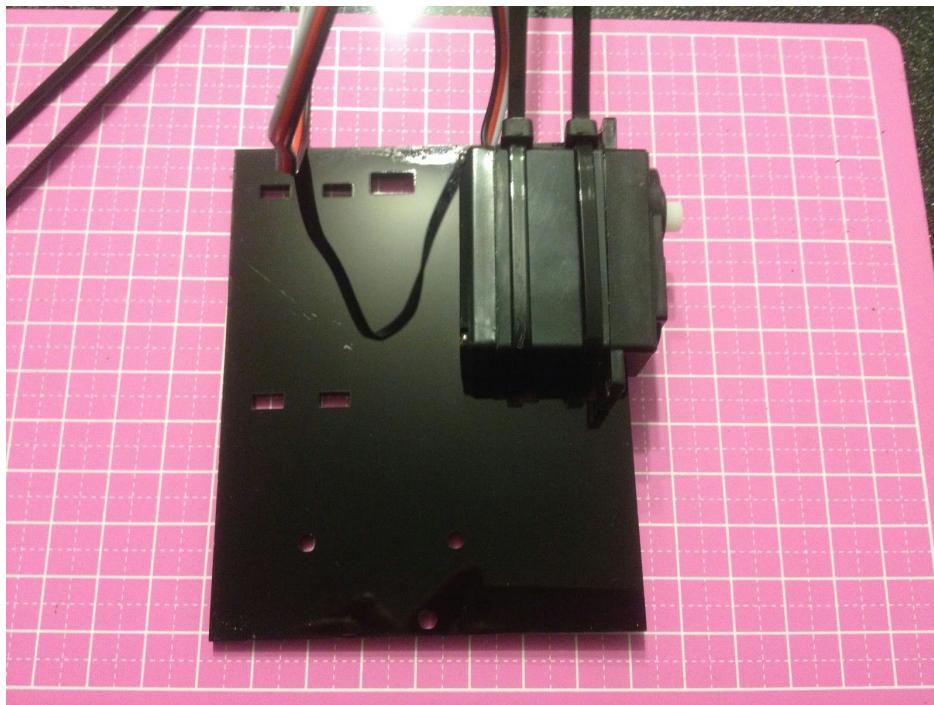
Multi-function shield

Assembly

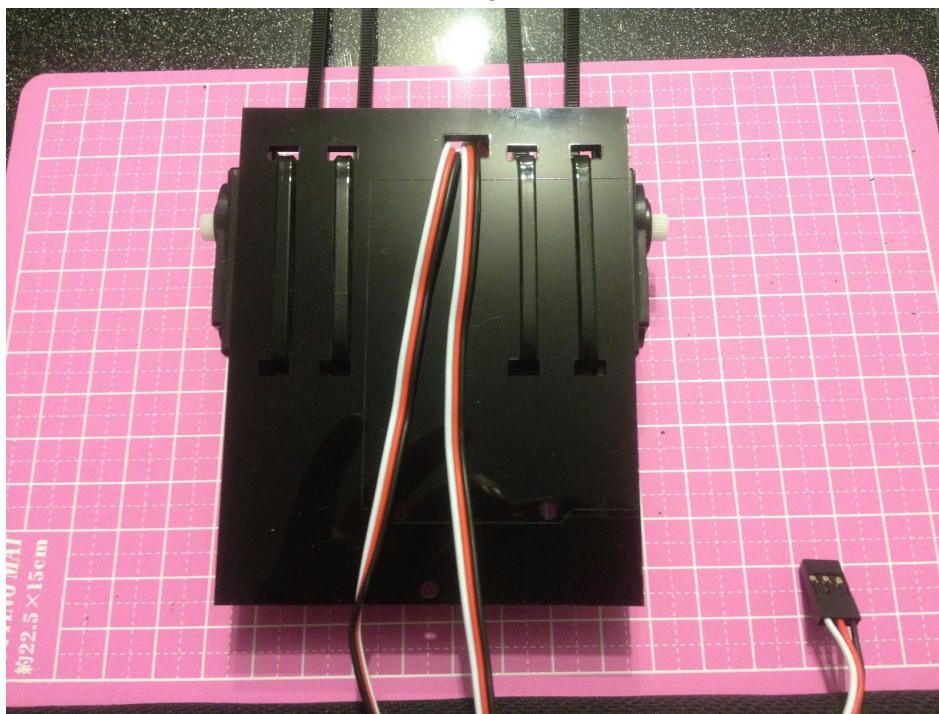
First, you'll need to attach the continuous rotation servos to the base plate. Align the baseplate so that the single round hole is at the front, as shown below. The outline of the Arduino is on the top side of the base plate. The servos attach by cable ties to the underside of the base plate.



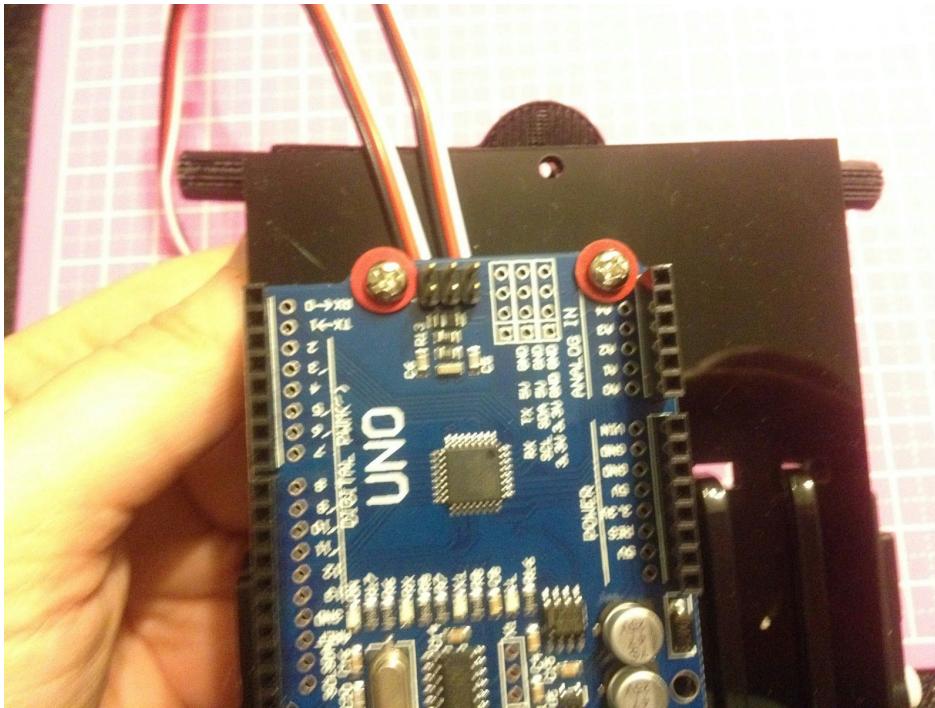
Thread the cables ties through the rectangular holes and then turn the base plate over to attach the servos. Make sure that the servo horn is towards the back of the base plate.



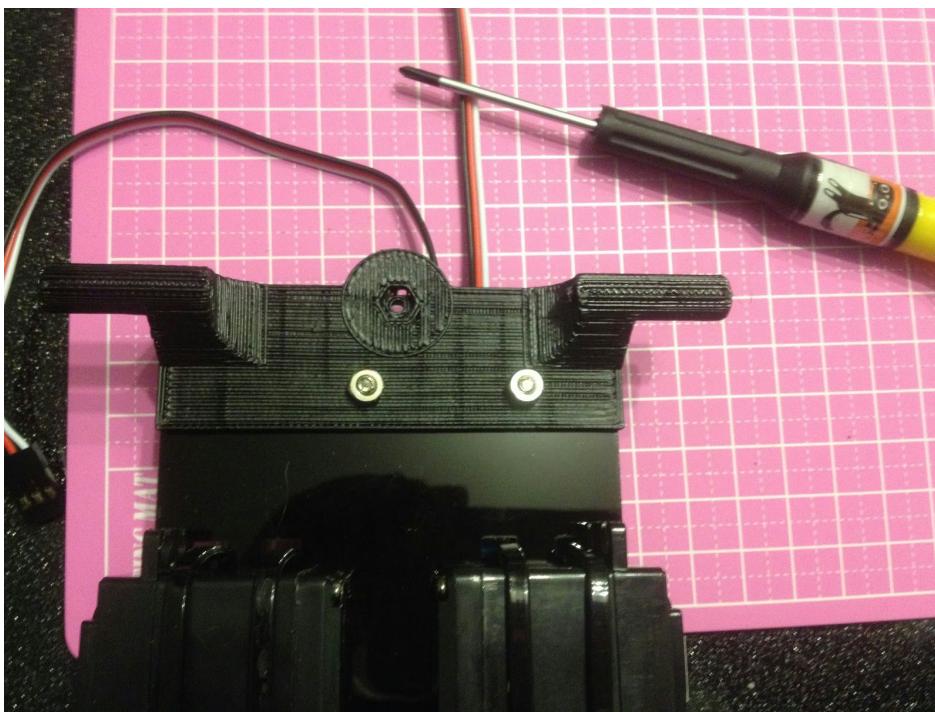
Attach both servos with 2 cable ties. Leave the cable ties a little bit loose at this point so you can adjust the servo positioning later. Thread the servo cables through the remaining rectangular hole at the rear of the baseplate. Bring the wires forward to the front of the plate as shown:



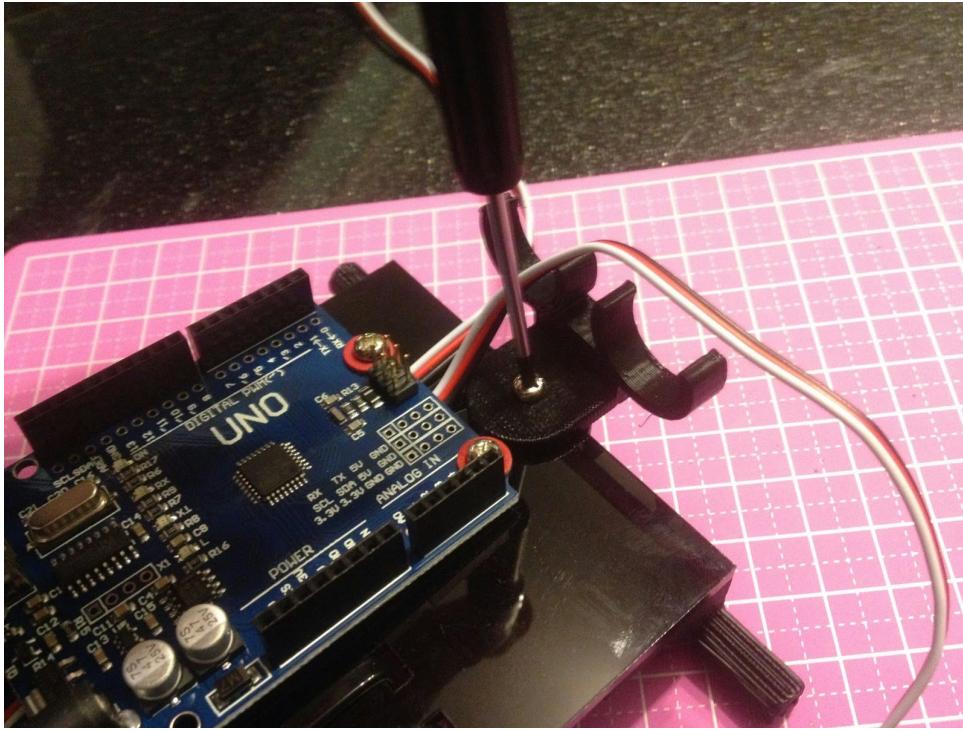
Next, you'll need to attach the Arduino (or compatible) board. Place the Arduino over the outline etched into the baseplate so that holes align. Thread two M3 bolts through fibre washers and then through the two front holes of the Arduino and through the corresponding holes in the baseplate and front axle. The servo wires run underneath the Arduino.



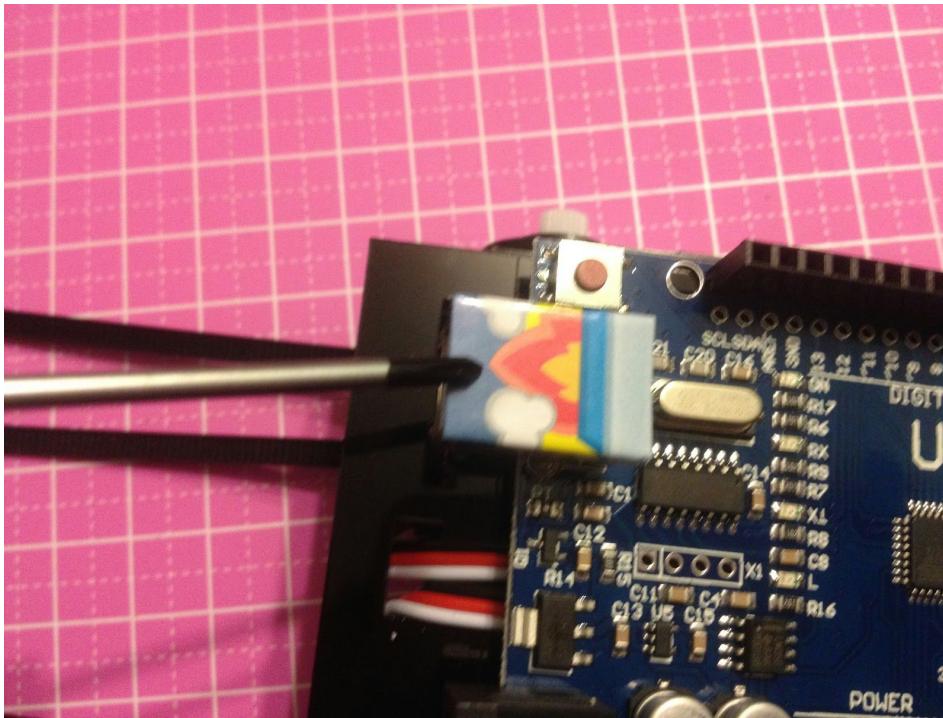
Secure the bolts with nuts underneath the axle. Do not do these up too tightly or you will squash the servo wires .



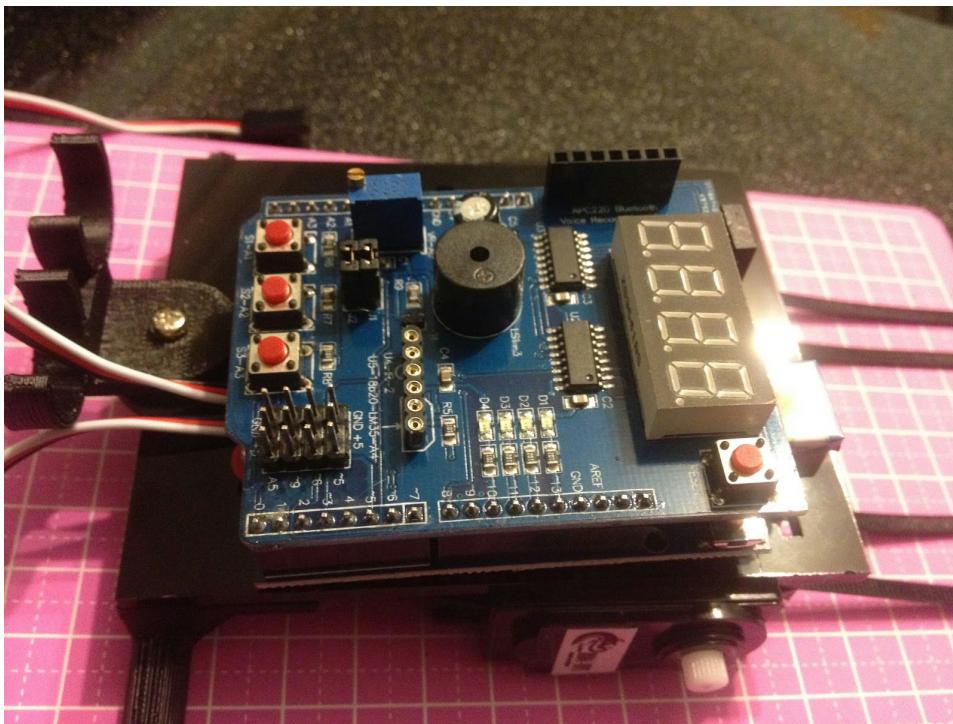
Attach the sensor mount by threading an M3 bolt through the front hole of the baseplate and securing with a nut underneath.



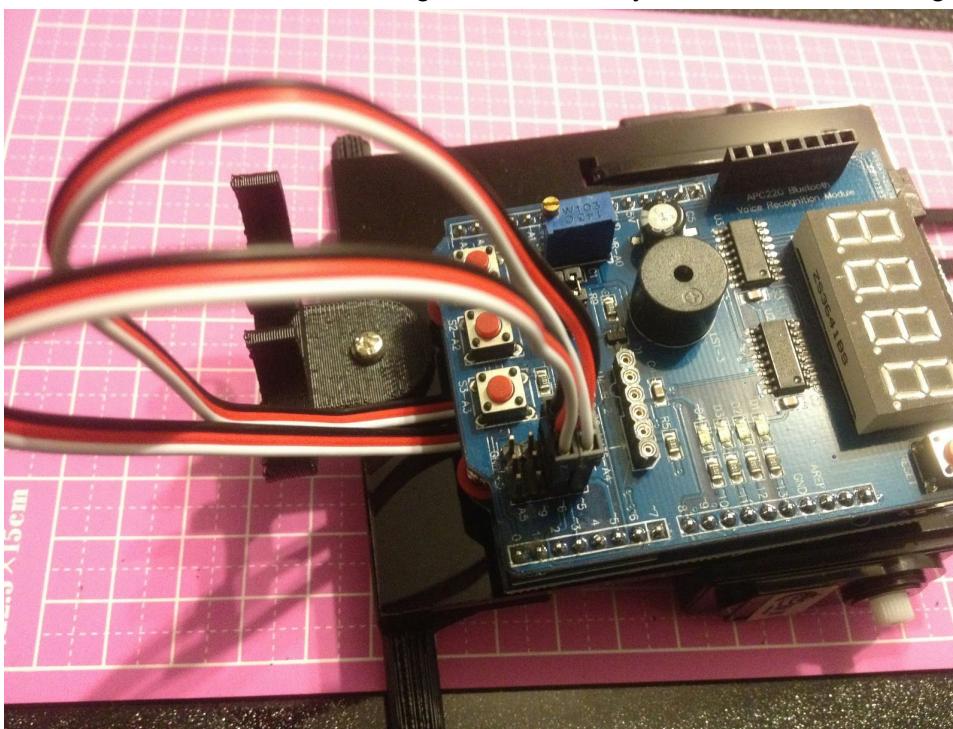
Use a sticker to cover the USB port on the Arduino. This will prevent metal on the underside of the multi-function shield from contacting the metal on the USB port, which can potentially cause shorts.



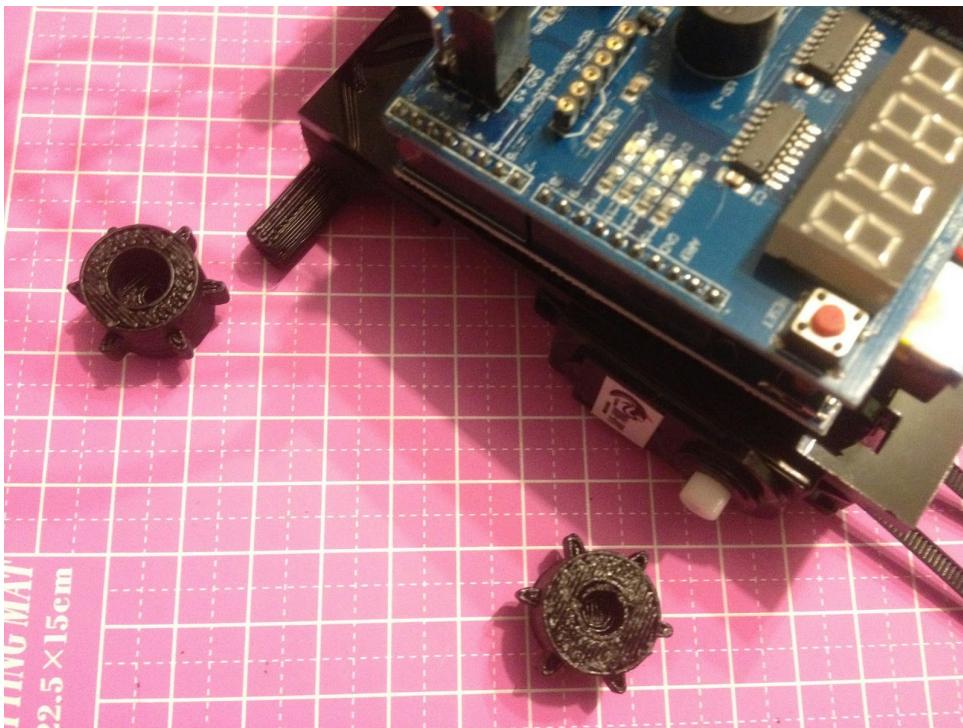
Plug the multi-function shield into the Arduino. You may need to push on the pins gently so that they line up with the headers on the Arduino.



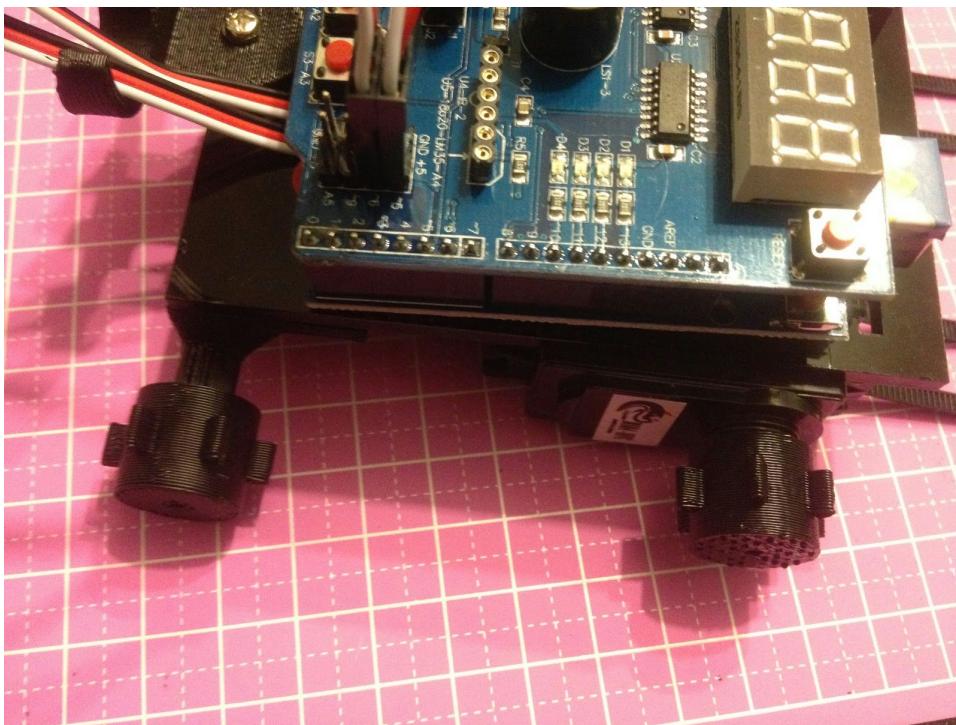
Connect the servo wires to the pin headers for IO pins 5 and 6. Ground and 5+ pins are marked on the shield - use these markings to make sure you have the cables aligned correctly.



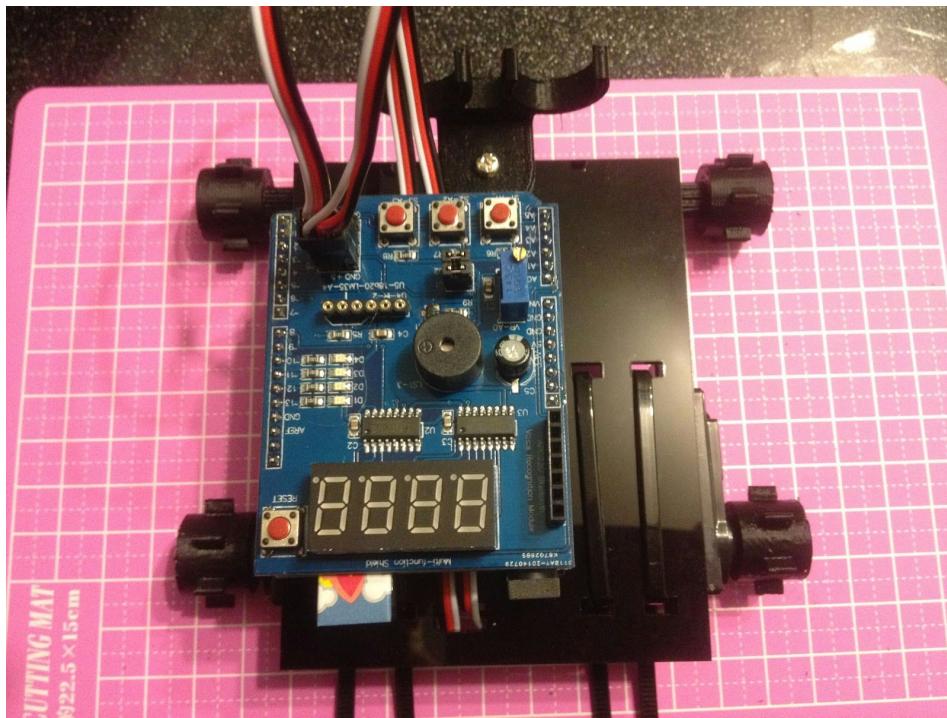
Attach the wheels. The wheel with the larger center hole goes on the front axle.



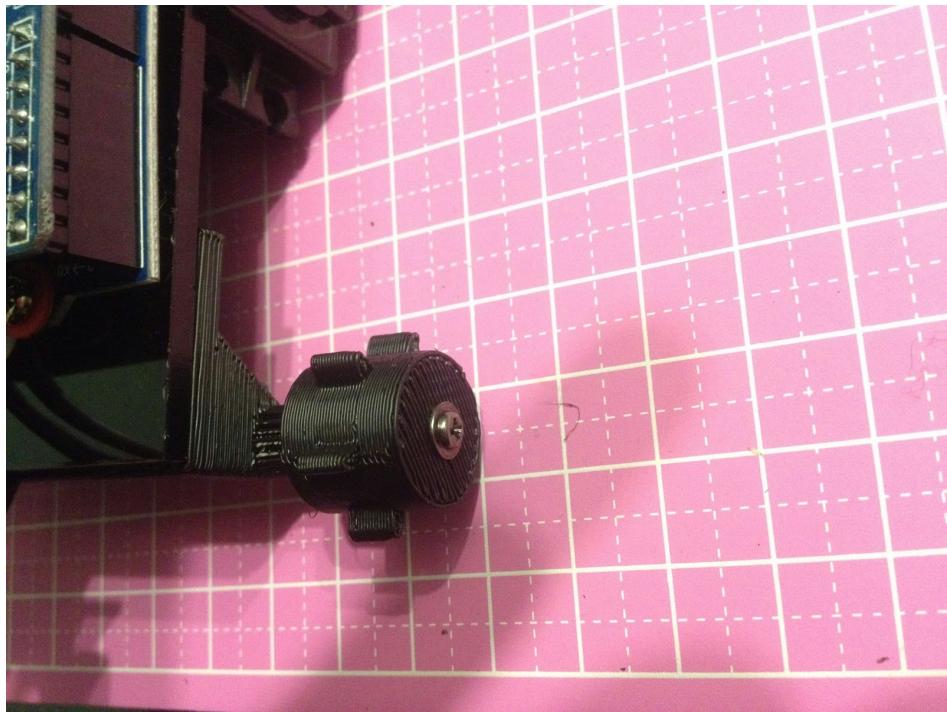
The back wheel that goes into the servo is a tight fit - push gently while supporting the back of the servo.



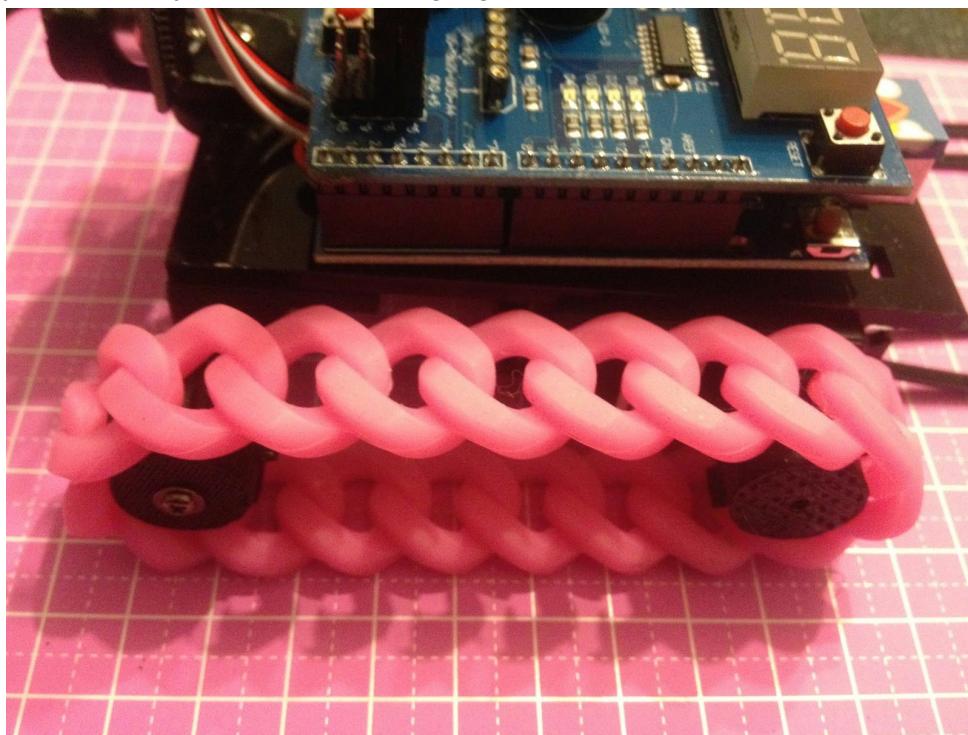
Check the alignment of the wheels - you may need to adjust the servo positioning slightly so that they line up.



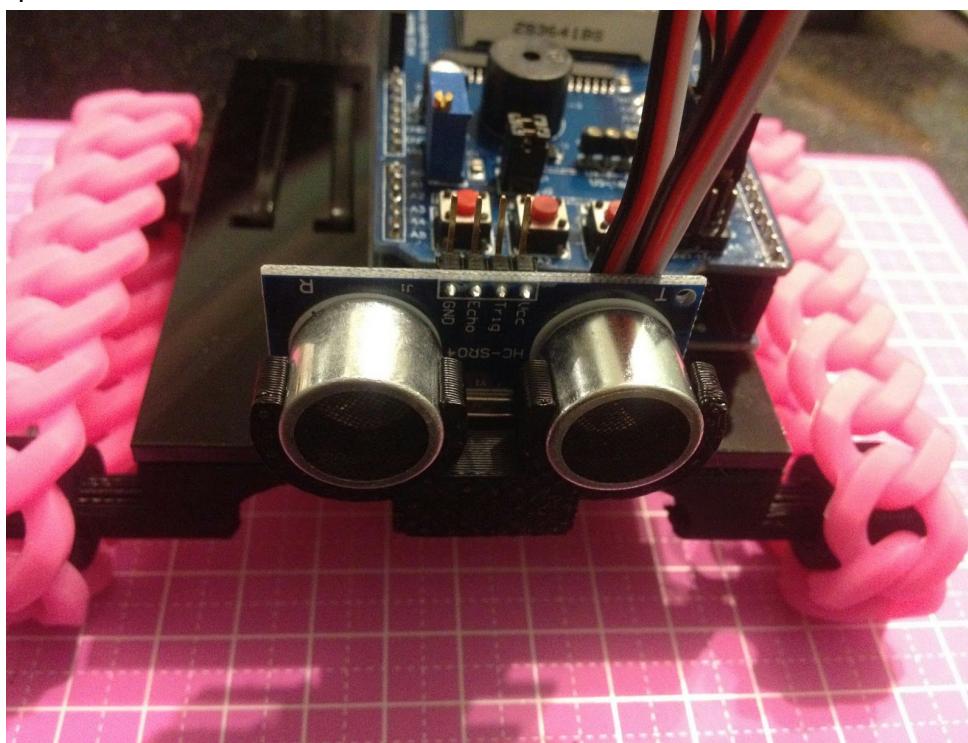
Secure the front wheels using small screws. The wheels need to be able to rotate, so don't make these too tight.



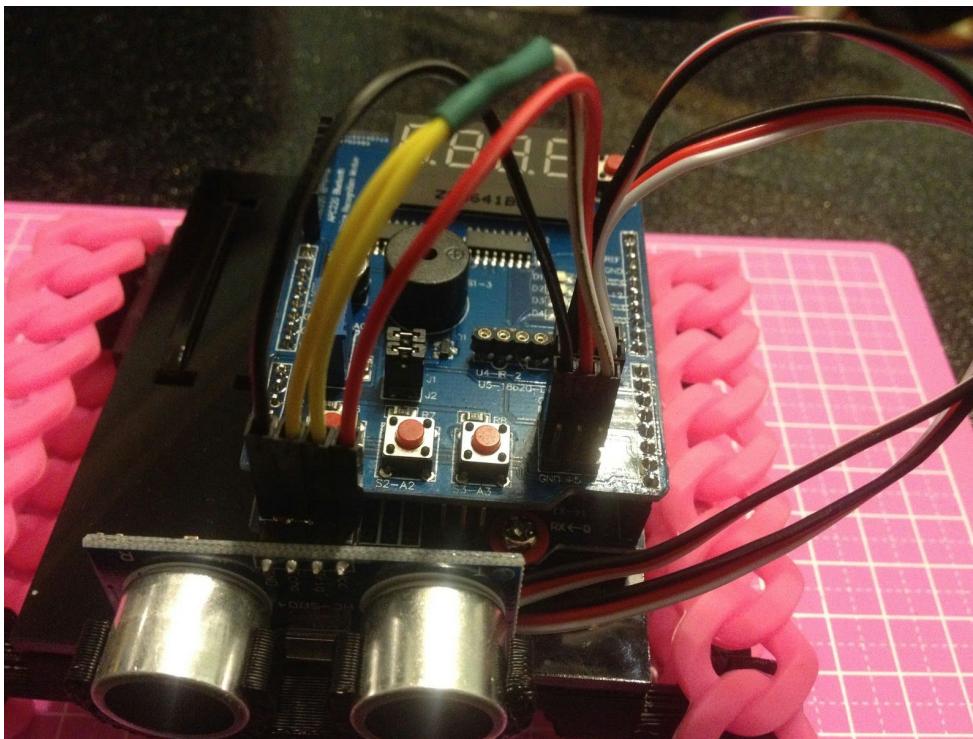
Attach the tracks to the wheels. You may need to turn your tracks inside out if the flatter sides are not facing out. If the tracks are too sloppy, push the servos further towards the back. When you are happy with the positioning, tighten the servo cable ties and trim the excess off the ends.



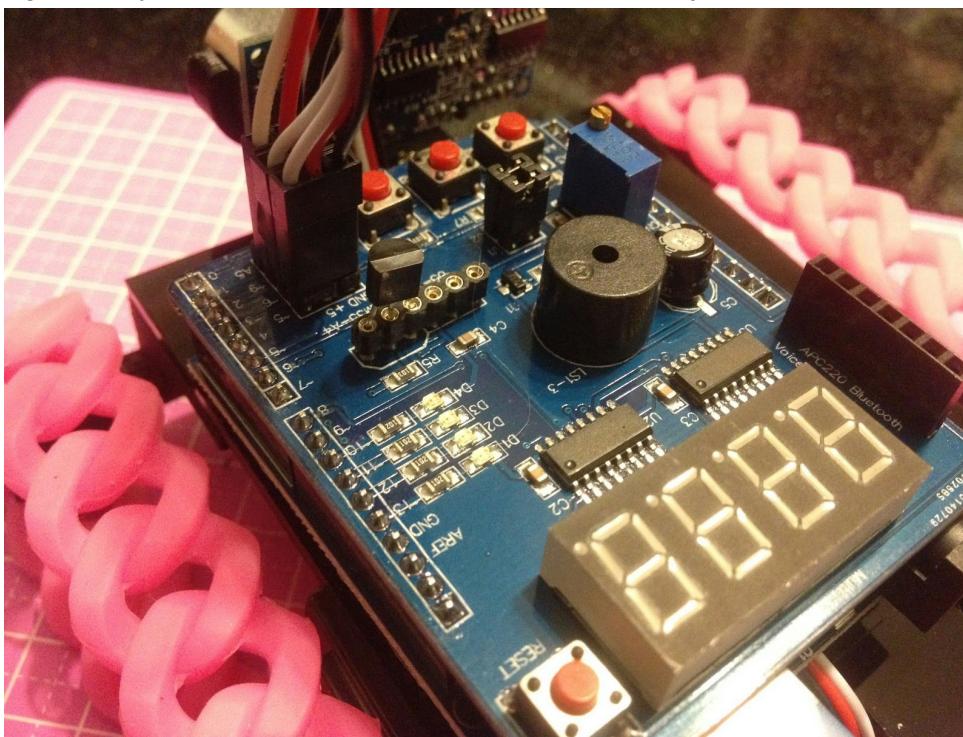
Slide the ultrasonic sensor into the sensor mount at the front of the bot so that the pins face upwards.



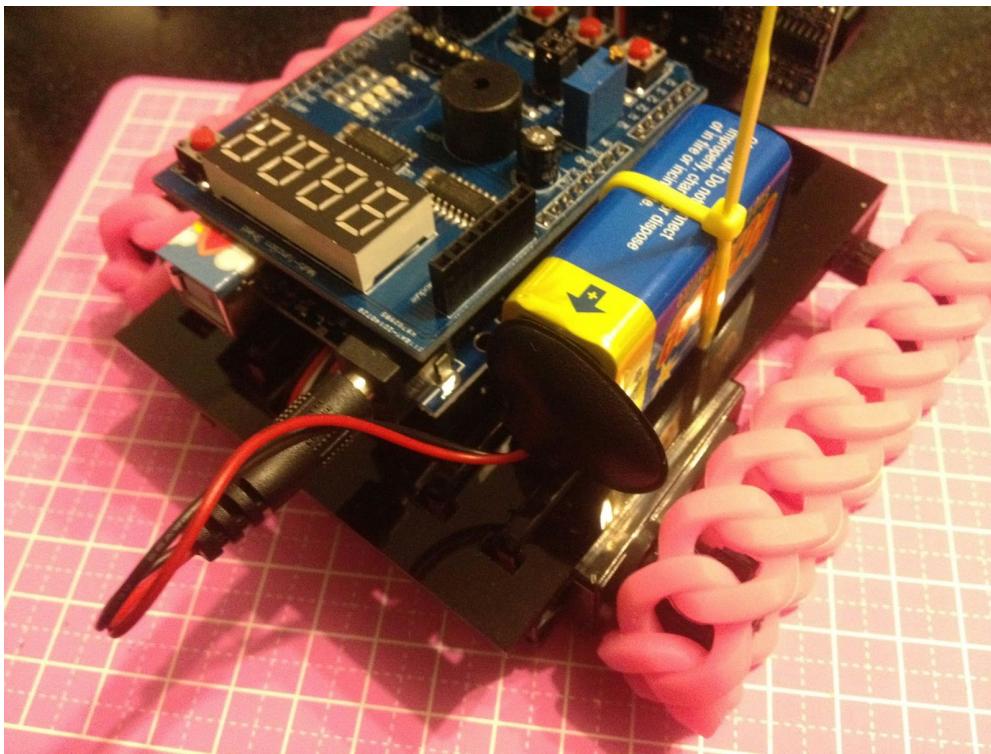
Attach the ultrasonic sensor cables to IO pin 9 on the shield - make sure ground, 5V and signal are connected to the correct pins (as shown):



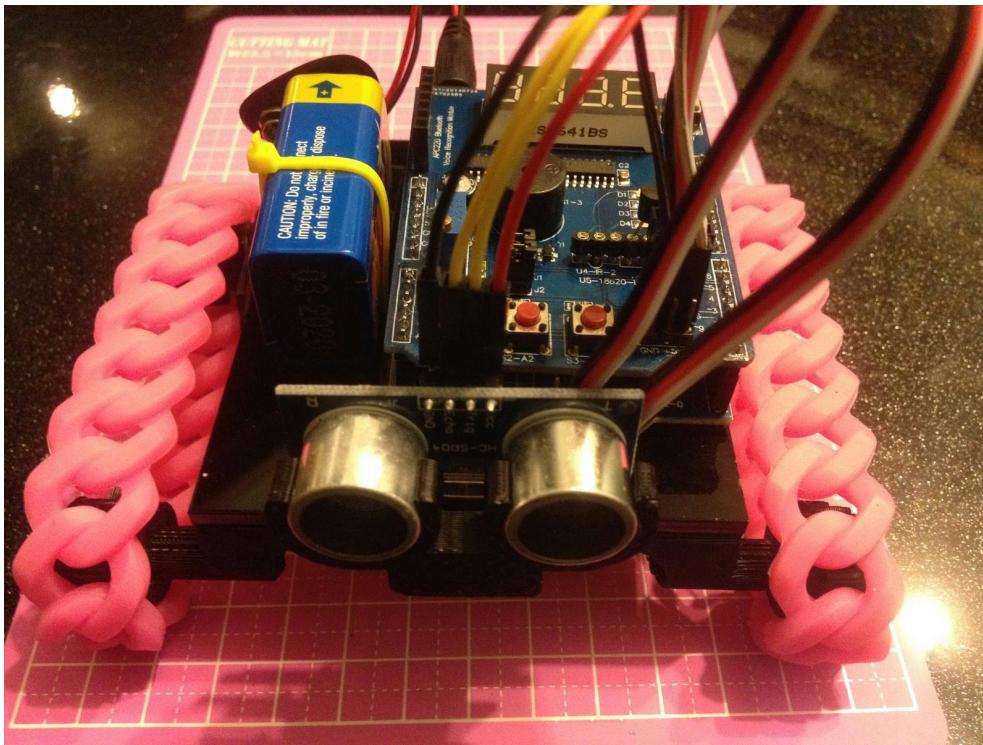
Plug in the temperature sensor. The flat side of the sensor component should face towards the digit display (for LM35 temperature sensor). Remove jumper J1 from the shield.



Thread a thin cable tie through the front set of rectangular holes to hold the 9V battery. Attach the battery clip.



Trim the excess from the battery cable tie and use additional tiny cable ties to neaten up the sensor and servo cables if you wish. Your bot is ready to go!



You can store the bot in the bottom section of the kit box when you are not using it:

