ETA: Build an Arduino-based Robot Car

Box 1: Mechanical Kit

Acrylic platform

2 geared motors

2 front wheels

1 rear swivel wheel

M3 screws

Box 2: Electronics

Arduino Uno R3

USB cable

Dupont wires (count, sizes, types)

Power rail from prototype board

Supplementary Pack

L298N dual H-bridge

2 IR proximity sensors

Second acrylic platform

4 25mm stand-offs

M3 screws and nuts

Zip ties

Crimp-on connectors

Optional

IR remote sensor + IR remote

Beeper

Ultrasonic sensor

Line sensors

LEDs

Build

Step 1: Prepare Motors

Add a zip tie around wires for a strain relief

Step 2: Mount Motors to lower platform

Step 3: Mount Caster to lower platform

Attach 4 stand-offs first

Step 4: Mount battery pack to upper platform

Step 5: Mount L298N to upper platform with 2 stand-offs

Step 6: Mount Arduino Uno to upper platform

Step 7: Mount 2 X IR proximity sensors to upper platform

Step 8: Attach upper to lower platform

4 x M3x25+5 stand-offs, 4 x M3x6, 4 x M3 nuts

Step 9: Wiring

Add power rail

Connect 5V, GND to rail

Attach proximity sensors to power, 2,3 to output

Fire up Arduino, test (see Programming)

Shut down Arduino

Strip wires: battery, motors

Crimp on terminals

Step 10: Programming

Blink test

Proximity sensor test

Motor Test

Line Following?

Power

The Arduino Uno board can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER connector.

The board can operate on an external supply from 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may become unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- Vin. The input voltage to the Arduino/Genuino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- 5V.This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.
- 3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- GND. Ground pins.
- IOREF. This pin on the Arduino/Genuino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs to work with the 5V or 3.3V.