



# **SparkFun**

# **Arduimoto Shield**

## **MCHE 470 – Fall 2013**

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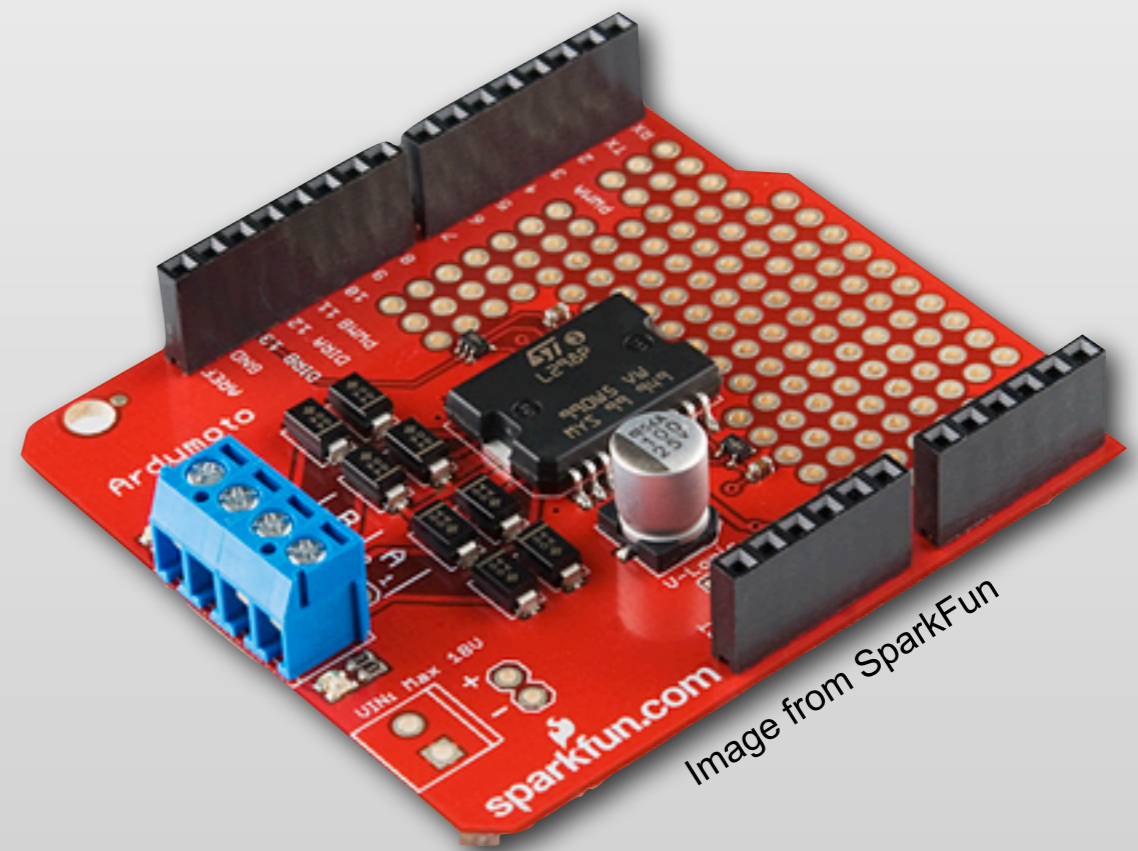
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# Arduino Shields



- Designed to “plug into” Arduinos
- Many types available - <https://www.sparkfun.com/categories/240>
  - GPS
  - Wi-Fi
  - Datalogging (memory)
  - Motor drivers
- Most have libraries available



# The Ardumoto Shield



- Allows high(er) current output to motors than Arduino alone
- Allows reversing direction
- Comes with the headers uninstalled
- Assembly Guide  
<https://www.sparkfun.com/tutorials/183>

# Programming Ardumoto



- Need to specify speed *and* direction

```
arduino_Ardumoto_basic | Arduino 1.0.5
arduino_Ardumoto_basic
Modified:
* mm/dd/yy - Name (email if not same person as above)
  - major change 1
  - major change 2
* mm/dd/yy - Name (email if not same person as above)
  - major change 1
-----*/

int pwm_a = 3;      // PWM control for motor outputs 1 and 2 is on digital pin 3
int pwm_b = 11;     // PWM control for motor outputs 3 and 4 is on digital pin 11
int dir_a = 12;     // direction control for motor outputs 1 and 2 is on digital pin 12
int dir_b = 13;     // direction control for motor outputs 3 and 4 is on digital pin 13

// This is always run once when the sketch starts
void setup()
{
  pinMode(pwm_a, OUTPUT); //Set control pins to be outputs
  pinMode(pwm_b, OUTPUT);
}

Done Saving.

avrdude done. Thank you.
```

# Programming Ardumoto (cont.)



- set `pinMode()`s to `OUTPUT`

```
arduino_Ardumoto_basic | Arduino 1.0.5
-----*/
int pwm_a = 3;    // PWM control for motor outputs 1 and 2 is on digital pin 3
int pwm_b = 11;   // PWM control for motor outputs 3 and 4 is on digital pin 11
int dir_a = 12;   // direction control for motor outputs 1 and 2 is on digital pin 12
int dir_b = 13;   // direction control for motor outputs 3 and 4 is on digital pin 13

// This is always run once when the sketch starts
void setup()
{
  pinMode(pwm_a, OUTPUT); //Set control pins to be outputs
  pinMode(pwm_b, OUTPUT);
  pinMode(dir_a, OUTPUT);
  pinMode(dir_b, OUTPUT);
}

// This runs immediately after setup, looping indefinitely

Done Saving.
avrdude done. Thank you.

31 Arduino Uno on /dev/tty.usbserial-A601EGPS
```

# Programming Ardumoto (cont.)



- Set direction, the PWM duty cycle

```
arduino_Ardumoto_basic | Arduino 1.0.5
arduino_Ardumoto_basic
// This runs immediately after setup, looping indefinitely
void loop()
{
  digitalWrite(dir_a, LOW); //Set motor direction, 1 low, 2 high
  digitalWrite(dir_b, LOW); //Set motor direction, 3 high, 4 low

  //set both motors to run at 100% duty cycle (fast)
  analogWrite(pwm_a, 255);
  analogWrite(pwm_b, 255);

  // run for 1000ms (1 s)
  delay(1000);

  //set both motors OFF
  analogWrite(pwm_a, 0);
  analogWrite(pwm_b, 0);

  // stay off for 1000ms (1s)
  delay(1000);
}

Done Saving.
avrdude: Send: Q [51] [20]
avrdude: Recv: . [14]
avrdude: Recv: . [10]
31 Arduino Uno on /dev/tty.usbserial-A601EGPS
```

# Things to look out for



- Your RedBoard/USB can only supply 500mA
  - Torque output is limited
  - Don't grab onto the motor shaft and stop it
  - Don't instantaneously switch direction, stop first
- The motor from your kit is *not* reversible