Project 2-3: Motor Control
Questions?
Project 1

• Finish demos
• Catme surveys are due on Friday
  • Everyone should have received email already
Project 2-3: Motor Driver Control

• Lift fan: bidirectional control
  • Full H-bridge
  • PWM signal specifies thrust
  • 2 digital outputs specify thrust direction

• Lateral fans
  • ½ H-bridge each
  • PWM signal for each specifies thrust
Component 1: Circuit

- H-bridge to Arduino board
  - PWM (3) and direction control signals (2)
  - Arduino power and ground

- H-bridge to power:
  - Power harness + switch + batteries

- H-bridge to fans

Be careful with direct battery power!

Andrew H. Fagg: Embedded Real-Time Systems: Digital IO
Component 2: Interface Functions

```c
int16_t clip(int16_t value, int16_t min_value, int16_t max_value)

void set_lift_motor_direction(LiftMotorDirection direction)

void set_lift_motor_magnitude(int16_t magnitude)

void set_side_motor_magnitudes(int16_t magnitude_left, int16_t magnitude_right)
```
Component 3: Test Function

Depending on switch state:

• Ramp the middle fan up, then down, then reverse up and then down

• Ramp left up, then down, then right up and then down
Coding

• Make sure that each function that you implement does exactly what the specification says & no more
New Hardware for Today

• Frisbees

• 3 Fans (a couple will need to have a hole cut in the middle and the fan mounted – only use the gray or orange fans for this)

• 2 Batteries + trickle charger
  • Rapid chargers will be installed in Felgar 300

• Power harness

• Tools: wire cutters, wire strippers, needle nose pliers
Next Time

Project 2: Analog-to-digital systems