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!

Component 2: Interface Functions

```
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