Overview of System Design and Future Plans

*Andrew Arnold (MtgSaber)*

Pirover consists of many components, with many subcomponents. The System consists of a wifi-enabled robot, a Debian server machine, and a wifi-enabled, wireless control device. The relationship between these three tiers is as follows:

**Control**

**Device**

**Robot**

State Commands

State Commands

Audio/Video Feedback, State Reports

Audio/Video Feedback, State Reports

**Debian**

**Server**

Robot General Design:

* 3D-printed frame with 4 12V DC geared motors
* an attached camera arm with
  + a bidirectional continuous rotation servo for swiveling from the chassis,
  + a high-torque servo to form an “elbow”,
  + and two micro-servos to provide a sort-of eyeball movement for the attached camera
* Lithium-Ion battery array
  + 4 3.7VDC Li-Ion batteries connected in series to output 14.8VDC
* Motor drive and signal-routing circuit
  + Routes power to devices
  + Receives PWM and digital signals from Arduino
  + Routes some PWM signals to servo connectors
  + Translates remain PWM and digital into controls for 2 L293B ICs
  + Routes L293B output channels through stall-protection fuses to motor lead connectors
* Arduino
  + Receives USB Serial commands from Raspberry Pi and converts them into digital and PWM signals to be interpreted by the motor control and signal routing circuit
  + Receives feedback signals from servos and sends them back to Raspberry Pi via USB Serial
* Raspberry Pi
  + Brain of the robot
  + Control program communicates with and commands Arduino via Serial
  + Control program receives audio and video from camera arm
  + Control program sends audio/video and state reports to Debian server over wifi