Minutes – 9/23/12 EE Sub-meeting

Eagle

- Download Eagle
  - google: "cadsoft eagle". The first link should bring you to the website.
  - under "Downloads" there should be instructions for installing a free version
- There are 2 views
  - schematic: pick components and wire them together
  - board layout: layout the components as they would be placed on a board
- Eagle will generate files that can be sent out to manufacturers to print circuit boards
- Useful for future projects, in which we might create simple boards to help gather data for other subteams

Git

- Revision Control Software – allows us to concurrently make changes while avoiding conflicts; keeps track of old versions; learn more here: http://gitimmersion.com/
- To get access our git repository, make an account here: http://github.com then send Lisa (liulisa@mit.edu) your username
- If you use windows, you should also download this: http://code.google.com/p/tortoisegit/
- For macs and ubuntu, e-mail Rui or Lisa

Kicker Board

- controls kicking of the ball
- computer commands board to charge capacitor
  - takes 2-3 seconds to charge
  - audible humming noise b/c the board flips a switch to increase voltage (more explanation on this later, or read wikipedia page on buck converters)
- another computer command sends the energy through a solenoid, which creates a magnetic field, which pushes forward a plunger, which hits the ball
- vaporize resistor demonstration
  - Together the capacitors are 3 milliFarads and charge up to 250 V! For capacitors energy = (1/2)*C*V^2 → this is "like getting punched"
  - Instead of sending energy to solenoid, we placed a 5 kOhm resistor at the load terminals
  - Some equations:
    - V = I*Resistance
    - Power = I*V
    - 12.5 Watts across the resistor which is rated for 0.25 Watts.
  - Resistor smoked, then exploded. Remains are yet to be found.
  - Discussion about how to repeat the experiment with a hot dog.
    - Conclusion: it would be messy
- Takeaway: the capacitors are dangerous
  - neon light indicates when capacitors are charged
  - use discharge button, hold down for 5 seconds after light goes out before handling robot again

Possible projects

- circuits boards – other subteams need to gather stats
- debugging circuit boards (using oscilloscope)
- firmware?

Next few weeks:

9/30 – More about Kicker/Aux board
10/7 (or maybe later on this 4-day weekend) – Brushless boards
10/14 – Firmware