Project Description: Controlling quadcopter w/ Wiimote and incorporating sensors for safety

Bluetooth

WiFi

Mounted

Mounted

(goal)

http://www.groupon.sg/

http://embeddedcode.wordpress.com/

http://www.seeedstudio.com/

http://www.amazon.com/

https://www.sparkfun.com/

http://www.groupon.sg/
Project Description (Block Diagram of Networking)

**NOT IN FLIGHT**

- **WiiMote**
- **Bluetooth**
- **Laptop**

**IN FLIGHT**

- **Proximity Sensors**
- **Physical**
- **mbed Microprocessor**
- **Wifi**
- **Quadcopter**

- **Power**

Connection:
- Bluetooth from WiiMote to Laptop
- Wifi from Laptop to Quadcopter
Project Functionality - Composition State Machine w/ Preemptive & Reset Transition
Project Implementations - How to Turn

Pros:
- Game-like experience
- Quadcopter imitates WiiMote
- Faster to change direction

Pros:
- Camera always facing forward
- Feels more stable
- Less dependent on user being aligned with quadcopter
Weight Analysis: Payload max (theoretical) = 200g
(experimental) = 120g

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drone (skeleton + cover)</td>
<td>338 [g]</td>
</tr>
<tr>
<td>AR Drone Battery:</td>
<td>101 [g]</td>
</tr>
<tr>
<td>mbed:</td>
<td>21 [g]</td>
</tr>
<tr>
<td>wifi module:</td>
<td>5 [g]</td>
</tr>
<tr>
<td>nuts and bolts:</td>
<td>12 [g]</td>
</tr>
<tr>
<td>9V Battery:</td>
<td>46 [g]</td>
</tr>
<tr>
<td>Breadboard:</td>
<td>15 [g]</td>
</tr>
<tr>
<td>Regulator Circuit:</td>
<td>5 [g]</td>
</tr>
<tr>
<td>Sensors: 8.5 [g] each</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL PAYLOAD = 138 [g]

= 92 [g]
Weight analysis 2 (distribution)

Maximum thrust

- No weight
- Centered weight
- Off-centered weight

http://www.amac.ru/upload/iblock/1df/1df860b6944041b45a2d3de1a25133df.jpeg
Keeping it real...time
Where rubber meets the road
Conclusion

- ENORMOUS thanks to Antonio Iannopollo (our main GSI) for being with us every step of the way, as well as Ben Zhang and John Finn for answering any other questions we had.

- We are grateful to professors Edward Lee and Alberto L. Sangiovanni-Vincentelli for giving us deeper insights into the world of embedded systems, as well as solidifying our understanding of the relationship between modelling, design, and analysis.

- Questions?
Resources

http://www.amazon.com/ADAFRUIT-INDUSTRIES-BREAKOUT-CC3000-MODULE/dp/B00GQM9IFY
http://ardrone2.parrot.com
https://www.sparkfun.com/products/8958
http://www.groupon.sg/deals/shopping/Groupon-Delivery/716917936
http://www.amazon.com/Bastens-battery-upgrade-Parrot-AR-Drone/dp/B004WPITUC
http://www.better-bargains.co.uk/duracell-9v-battery.html
http://www.clipartbest.com/cliparts/niB/gXj/niBgXjoiA.png