Balloon Sniper
Team: Null

Jeff Johnson
JinWoo Roh (Mir)
Tracks a balloon and shoots it
Can rotate in 2 Dimensions
Uses image processing (OpenCV)
Laptop runs C++/OpenCV sends commands to uC
uC controls servos that actuate the platform and Airsoft gun
Project Description
Solution

- Webcam – moderate speed, high resolution
- OpenCV/C++
- Laptop -Dell XPS M140
- uC board – Atmega32
- Debugging with GUI on laptop
- Image is brought in
- Converted from RGB -> HSV
- Value for Hue is compared
- Center of mass of resulting image
- X, Y value center (pixels) is converted to servo commands
- Servo commands are sent via serial communication
Flow Chart

1. Web Cam
2. Sending Images
3. Image Capture
4. OpenCV
5. Image Processing
6. FTDI
7. Visual Studio
8. Serial
9. Analog Board
10. ATMEGA32
11. Left & Right Up & Down
12. PWM
13. Behavior
14. MOSFET Switch
15. Firing mechanism / machine assembly
16. MOSFET Trigger
17. Power Supply
18. GUI
19. Program
20. Display
## Project Costs

<table>
<thead>
<tr>
<th>Items</th>
<th>Price</th>
<th>Quantity</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servo Motors</td>
<td>$10</td>
<td>x 2</td>
<td>$20</td>
</tr>
<tr>
<td>Web Cam</td>
<td>$100</td>
<td>x 1</td>
<td>$100</td>
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<tr>
<td>ATMEGA Chip</td>
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<td>x 1</td>
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<td>FTDI Chip</td>
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<td>x 1</td>
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<td>Balloons</td>
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<td>Wood</td>
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<td>Airsoft Gun</td>
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<td>x 1</td>
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<tr>
<td>Misc &amp; Electrical Components</td>
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<td>Shipping</td>
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<td><strong>Total</strong></td>
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<td><strong>$179</strong></td>
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# Division of labor

## Team Responsibility Table

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<thead>
<tr>
<th></th>
<th>Jeff Johnson</th>
<th>Mir Roh</th>
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<tbody>
<tr>
<td>Research &amp; Presentation</td>
<td>50%</td>
<td>50%</td>
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<tr>
<td>CAD Design</td>
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<tr>
<td>Board Design</td>
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<tr>
<td>Analog Design</td>
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<tr>
<td>OpenCV Programming</td>
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<tr>
<td>ATMEGA Programming</td>
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<td>Order Components</td>
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<tr>
<td>Integrating</td>
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<tr>
<td>Debugging / Testing</td>
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<tr>
<td>Mechanical Design</td>
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<tr>
<td><strong>Overall</strong></td>
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<td><strong>50%</strong></td>
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Gantt Chart

- Planning (Team)
- Research & Project Proposals (Team)
- Mechanical Platform (Mir)
- Board Design (Jeff)
- OpenCV Programming (Jeff)
- ATMEGA Programming (Mir)
- Debugging (Team)
- Completing Mechanical & Software (Team)
- Integrating (Team)
- Testing (Team)
- Finalization & Presentation (Team)

Start Date | Duration (days)
--- | ---
5/11/2009 | 
5/21/2009 | 
5/31/2009 | 
6/10/2009 | 
6/20/2009 | 
6/30/2009 | 
7/10/2009 | 
7/20/2009 | 

The Gantt chart above illustrates the timeline and duration of various tasks from May 11 to July 20, 2009.