PortableHUD by SafeVision

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Profile



Overview

- Background and Motivation
- High-level Design
- Schedule
- Material and Cost
- Business Case
- Future Foresee



Background and Motivation

Background

- Prevent accidents
- Eliminate cell phone usage while driving
- Motivation
 - Safety Concern
 - Minimize Distractions



High-level Design-Overview



High-level Design-Wireless Data Transmissio

Main Function

- Transmitting Data from Master Panel to Slave Panel
- ▶ To make the LCD part (Slave Panel) as lightweight as possible
- Challenges and Approach
 - Different types of data(ie. Direction, Time, Negative Temp.)
 - Limited Interrupt Pins
 - Organization of data for both transmitter and receiver



High-level Design-LCD

Main Function

- Display information
- ► GPS tracking system
- Challenges and Approach
 - Library
 - Loading image
 - Color spectrum
 - Power consumption
 - Uno vs Mega



High-level Design-GPS

- Main Function
 - Acquire GPS Information
 - Trajectory Tracking
- Challenges and Approach
 - Delay in Coordinates Updates
 - Speed Inaccuracy



High-level Design-Temperature and RTC

Main Function

- Acquire Temperature
- Acquire Real Time
- Challenges and Approach
 - Temperature effected by circuitry



http://physics.about.com/od/gl ossary/g/temperature.htm

Mechanical Design









High-level Design-Radio Communication

Main Function

- Team Communication for Group Sport
- Multiple Channels Available
- Radio
- Challenges and Approach
 - Microphone
 - Noise



http://patrickschneider.photoshelter.com/image/I0000.EU6frpNWro

Schedule

Original Schedule



| aak Nama | Chart | Einich | | | | Jan | | | | | Feb | | | | | Mar | | | |
|---|---|-------------------|-------|---------------|--------------|-------|--------|--------|--------|---------------|--------|--------|-------|---------------|---|------------|--------------|--------|-------------------|
| ask Name | Start | Finish | 7 | lan 3 | Jan 1 | 10 J | an 17 | Jan 24 | Jan 31 | Feb 7 | Feb 14 | Feb 2 | 1 Fe | b 28 N | lar 6 | Mar 13 | Mar 20 | Mar 27 | Apr 3 |
| i 💌 | 01/04/16 | 01/20/16 | ¢ | ପ୍ୟ | | | | | | | | 1 | | | | | | | |
| Opline/Legel Durchasing | 01/04/10 | 01/23/10 | | | | - | | | | | | | | | | | | | |
| Dreposel | 01/14/10 | 02/04/10 | _ | | | | | | | | | | | | | | | | |
| Froposal | 01/15/16 | 01/25/10 | | | | | | | | | | | | | | | | | |
| Design Reviews | 02/15/16 | 02/19/16 | | | | | | | | | | | | | | | | | |
| Design Specifications | 02/19/16 | 03/07/16 | | | | | | | | | _ | | | | | | | | |
| Assembly of module 1 | 02/01/16 | 03/07/16 | | | | | | | | | | | | | | | | | |
| Debugging and Testing 1 | 03/03/16 | 03/14/16 | | | | | | | | | | | | | | | | | |
| Assembly of module 2 | 02/01/16 | 03/07/16 | | | | | | | | | | | | | | | | | |
| Debugging and Testing 2 | 03/03/16 | 03/14/16 | | | | | | | | | | | | | | | | | |
| Assembly of module 3 | 02/01/16 | 03/07/16 | | | | | | | | | | | | | | | | | |
| Debugging and Testing 3 | 03/03/16 | 03/14/16 | | | | | | | | | | | | | | | | | |
| Overall implementation | 03/14/16 | 03/21/16 | | | | | | | | | | | | | | | | | |
| Commercial Video | 03/14/16 | 03/21/16 | | | | | | | | | | | | | | | | | |
| Written Progress Reports | 02/22/16 | 03/28/16 | _ | | | | | | | | | | | | | | | | |
| Test Plans | 03/15/16 | 03/28/16 | | | | | | | | | | | | | | | | | |
| Final Test | 03/17/16 | 04/02/16 | | | | | | | | | | | | | | | | | |
| Group Presentation/Demos | 03/24/16 | 04/08/16 | | | | | | | | | | | | | | | | | |
| Post-Mortems | 04/07/16 | 04/08/16 | | | | | | | | | | | | | | | | | |
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| fask Name | _ | | Jan 3 | Jan | Jan 10 Ja | an 17 | Jan 24 | Jan 31 | Feb 7 | Feb Feb 14 | Feb 21 | Feb 28 | Mar 6 | Mar Mar 13 | 8 Mar | 20 Mar | 27 Apr 3 | Apr 1 | Apr 0 Apr 17 |
| Fask Name Research | _ | | Jan 3 | Jan ⊕ | Jan 10 Ja | an 17 | Jan 24 | Jan 31 | Feb 7 | Feb Feb 14 | Feb 21 | Feb 28 | Mar 6 | Mar Mar 13 | 8 Mar | 20 Mar | 27 Apr 3 | Apr 1 | Apr 0 Apr 17 |
| fask Name Research Online/Local Purchasing | - | | Jan 3 | Jan ⊕ | Jan 10 Ja | an 17 | Jan 24 | Jan 31 | Feb 7 | Feb Feb 14 | Feb 21 | Feb 28 | Mar 6 | Mar Mar 13 | 8 Mar | 20 Mar | 27 Apr 3 | Apr 1 | Apr 0 Apr 17 |
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Materials and Costs

- Source of Funding
 - ▶ ESSS: \$300
 - Team Members Contribution

Actual Development Cost

| Items involved | Actual Cost | Estimated Cost |
|------------------------|-------------|----------------|
| Arduino Uno | 28.41 | 20 |
| Arduino Mega | 71.06 | 60 |
| 2.8' TFT LCD display | 9.67 | 55 |
| TEA5767 FM Stereo | | |
| radio | 6.22 | N/A |
| FM transmit | 27.45 | N/A |
| Micro phone Amplifier | 10.26 | N/A |
| Ball Speaker | 13.51 | N/A |
| GPS Breakout | 49.78 | 60 |
| RTC | 13.96 | 20 |
| Digital Temp Sensor | 6.36 | 15 |
| RF wireless | | |
| trans&receiver | 13.55 | 25 |
| Solderable breadboards | 9.47 | 25 |
| Jump wires | 15.15 | 15 |
| 9V battery *2 | 9.47 | 30 |
| GoPro mount | 2.50 | 10 |
| 3D printing enclosure | 20.00 | 60 |
| extendable support | 10 | 15 |
| tax & shipping | 47.33 | 50 |
| sum | 364.15 | 460 |

Business Case

- Current Market
 - Recon Jet: USD 399
 - Google Glass: USD 1500
- Estimated manufacturing Cost
 - Volume Production: Lower than CAD100 each
- Selling Price
 - ▶ \$150
- Competitive Advantages
 - Attachable to any helmet
 - Flexible
 - Safe



Recon Jet



BMW HUD helmet

Future Foresee

- Camera
- More Channels on RF
- Google Map API
- Move GPS to LCD side
- Antenna
- Lighter & Transparent Display



Conclusion

- Group Dynamics
 - Problems and Solution
 - ► Future Career
- What We Learned
 - More Research before Buying
 - Ask for more help
 - ► Etc.



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- TAs (Jamal, Hsiu Yang, Mahssa, Mona, and Soroush)

Video

..\..\Desktop\Final video.mp4



