



Input Devices Corporation



ENSC 440

April 25 2007

World of Warcraft Input Device

Vijay Galbaransingh

CFO

Calin Plesa

CTO

W. William Walczak

CEO

Input Devices Corporation





SFU

SIMON FRASER UNIVERSITY
THINKING OF THE WORLD

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Presentation | Agenda

- Motivation
- Game
- Problem
- Interface
- Market
- Solution
- Cost
- Timeline
- Problems
- Future Work
- Acknowledgments
- Conclusion
- **Demonstration**



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Presentation | Motivation

- Market possibilities
 - Financial
- Health Benefits
 - Reduce strain and increase comfort
- Great ENSC 440 Grade

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Presentation | Game

- World of Warcraft (WoW) has an expansive online community started Nov 23, 2004
- Now, over 8.5 million people
- Monthly subscription fee model (\$15/month)
- Expansion Pack sold 2.4 million copies in the first 24 hours
- Estimated \$1 billion income from subscriber revenue



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Presentation | Game



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InDev

Presentation | Game Screenshots



Presentation | Problem

- The Archaic Keyboard and Mouse
 - Invented 1866 (keyboard)
 - Invented 1968 (mouse)
- Repetitive strain injury (RSI)
- Lacking Efficiency
- Comfort

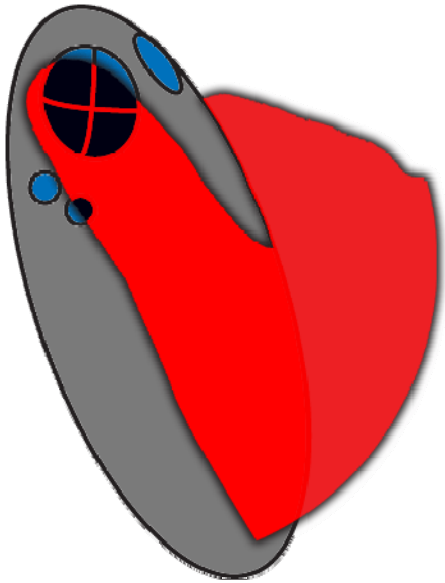


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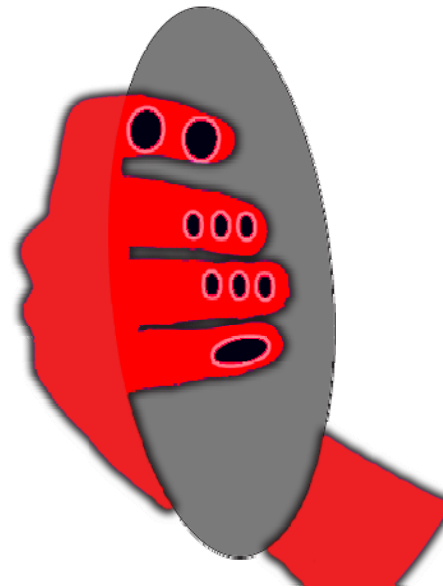


Presentation | Interface

- Proposed



Top



Bottom

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Presentation | Market

- What is available for Gamers?

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Presentation | Market

- What is available for Gamers?



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Presentation | Market

- Specifically

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Presentation | Market

- Specifically



ZBoard

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Presentation | Market

- Specifically



ZBoard



Gyration Air Mouse

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Presentation | Market

- Specifically



ZBoard



Gyration Air Mouse



Wolfking Warrior FPS

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Presentation | Solution

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Presentation | Solution

“Ultimate Goal is Efficiency with Ridiculous Comfort”

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Presentation | Solution

“Ultimate Goal is Efficiency with Ridiculous Comfort”

- Look at what is available
- Analyze what is needed and what is desired by gamers
- Design an input device that meets both goals
- Make it a viable solution tailored to the World of Warcraft gamer

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Presentation | Solution

- Arriving at a solution
- Integrating all the parts
- Mathematical Equation:

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Presentation | Solution

- Arriving at a solution
- Integrating all the parts
- Mathematical Equation:

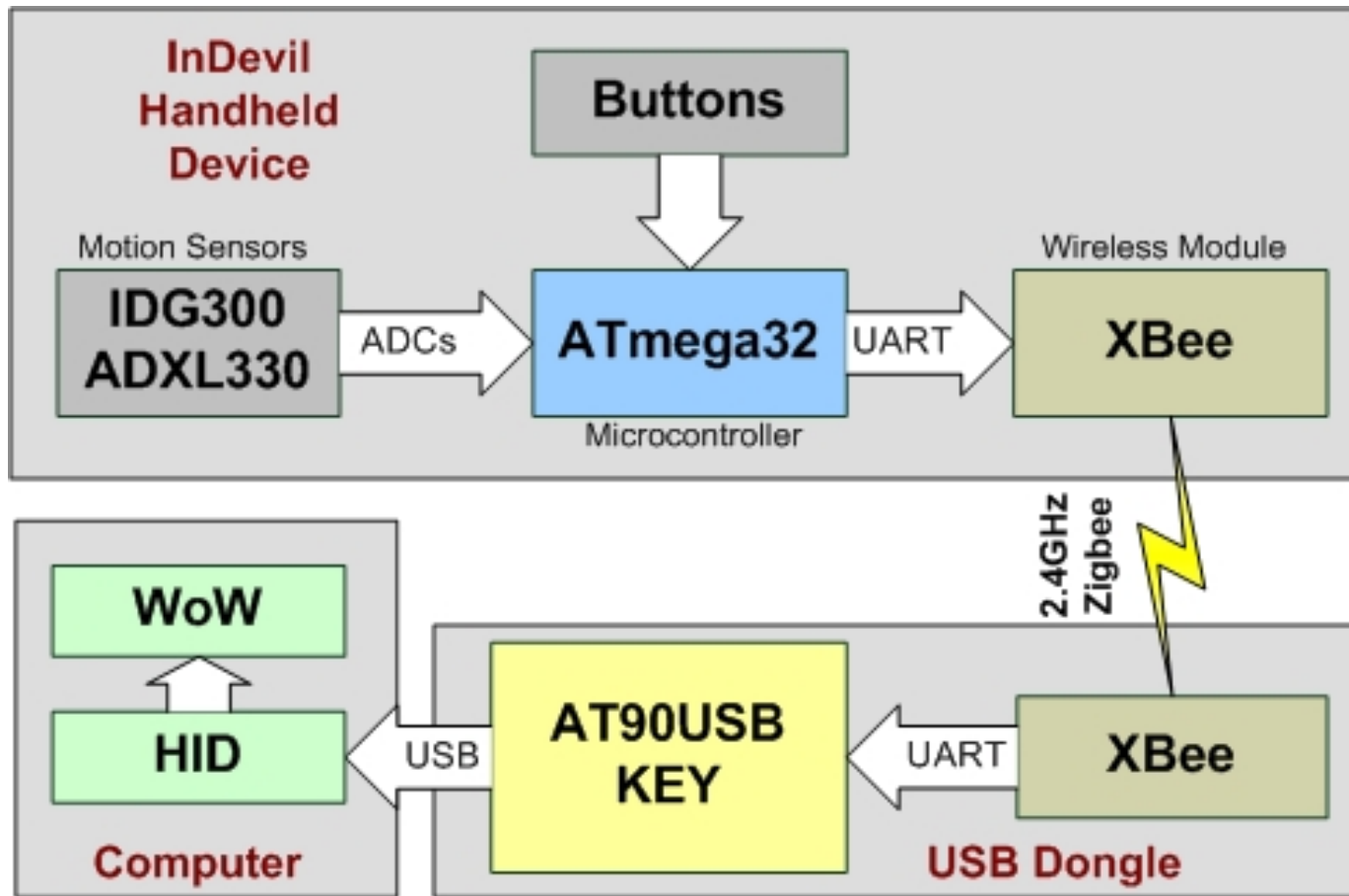
Last Night

\int (Wireless + Handheld + Comfortable + Capable + Reliable + Energy Drinks) = The Perfect Device
January

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Presentation | System Overview



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Presentation | Solution & Cost

- Integral Parts Used:

2	XBee Modules	Wireless Communication	57.6
1	Sparkfun 5 Degrees of Freedom	Gyroscopes (X and Y) Accelerometers (X, Y and Z)	155.39
1	AT90USBKEY	Computer Interface	37.24
1	ATMEGA32L	Remote Processing	10.14
13	Mouse Buttons	User Interaction	FREE
1	Acrylic Sheet	Case	10.23

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Presentation | Cost (Expected)

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Presentation | Cost (Expected)

Part Description	Estimated Prototype	Source	Estimated Production Cost
Sensors	\$160	RoboShop (IDG)	\$2
Micro-controllers	\$50	Digi-Key	\$5
Wireless System	\$80	Digi-Key	\$7
Power Source	\$40	Digi-Key	\$9
Other Electronic Parts	\$50		\$5
PCB Manufacturing	\$80	Gold Phoenix PCB	\$5
Case and Buttons	\$50		\$6
Contingency (25%)	\$128		\$10
Cost of Labour	-		\$8

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PCB Manufacturing	\$80	Gold Phoenix PCB	\$5
Case and Buttons	\$50		\$6
Contingency (25%)	\$128		\$10
Cost of Labour	-		\$8
Total Cost	\$638		\$57

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Presentation | Cost (Actual)

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Presentation | Cost (Actual)

Part Description	Estimated Prototype	Source	Estimated Production Cost
Sensors	\$160	Sparkfun	\$13
Micro-controllers	\$10	Digi-Key	\$5
Wireless System	\$54	Digi-Key	\$2
Power Source	\$2	Digi-Key	\$1
Other Electronic Parts	\$50		\$3
PCB Manufacturing	\$5		\$5
Case and Buttons	\$30		\$10
Other/Overstock	\$114		\$0
Cost of Labour	3 People x 14 NONSTOP days and nights x \$30 = \$-2400 ???		

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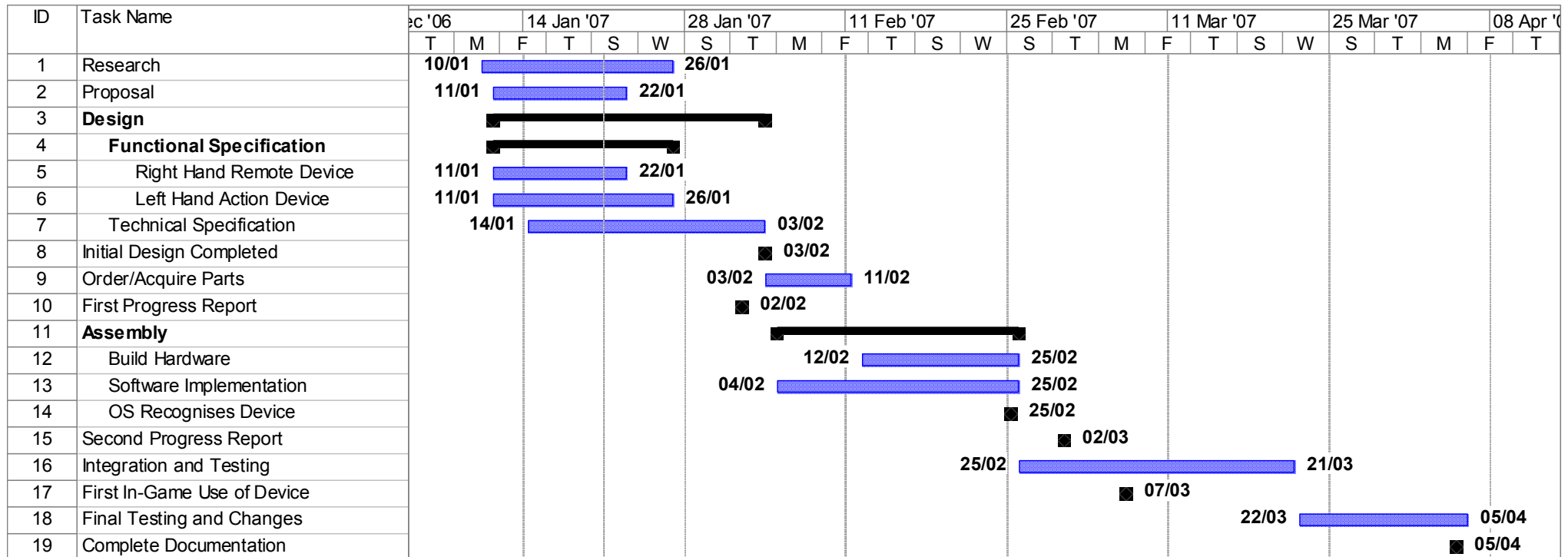
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Case and Buttons	\$30		\$10
Other/Overstock	\$114		\$0
Cost of Labour	3 People x 14 NONSTOP days and nights x \$30 = \$-2400 ???		
Total Cost	\$425		\$39

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Presentation | Timeline (Estimated)



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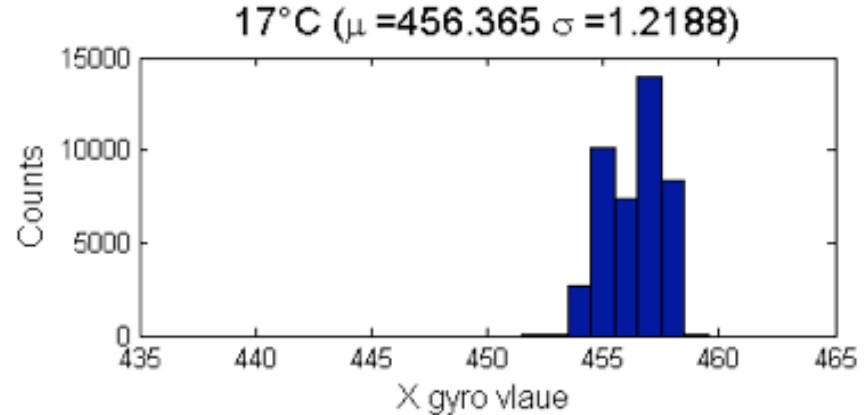
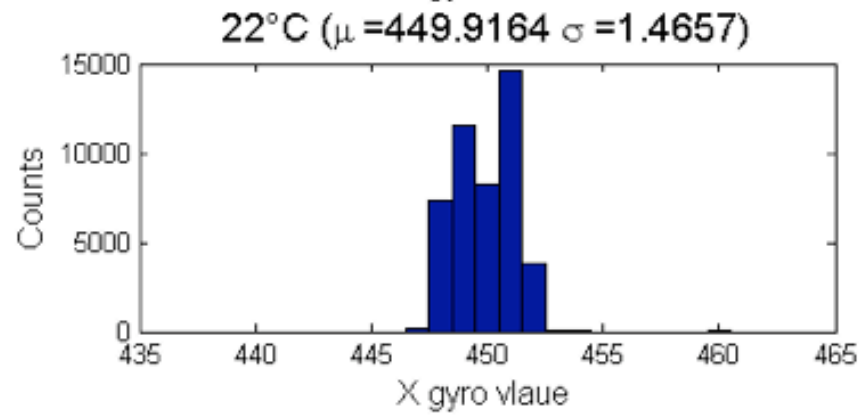
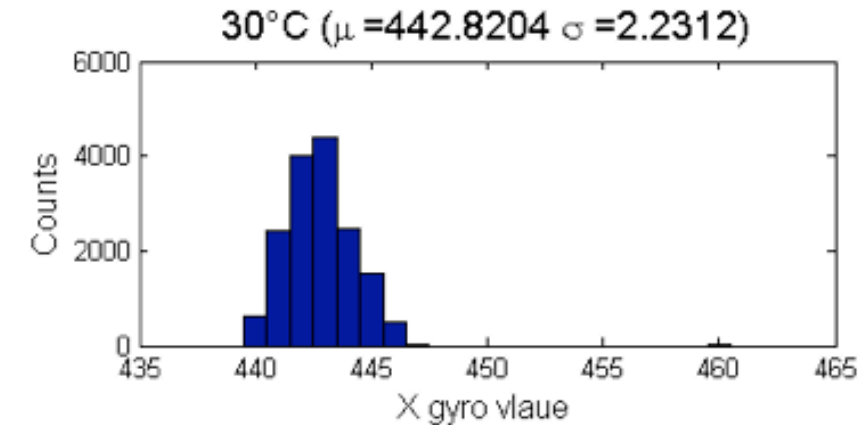
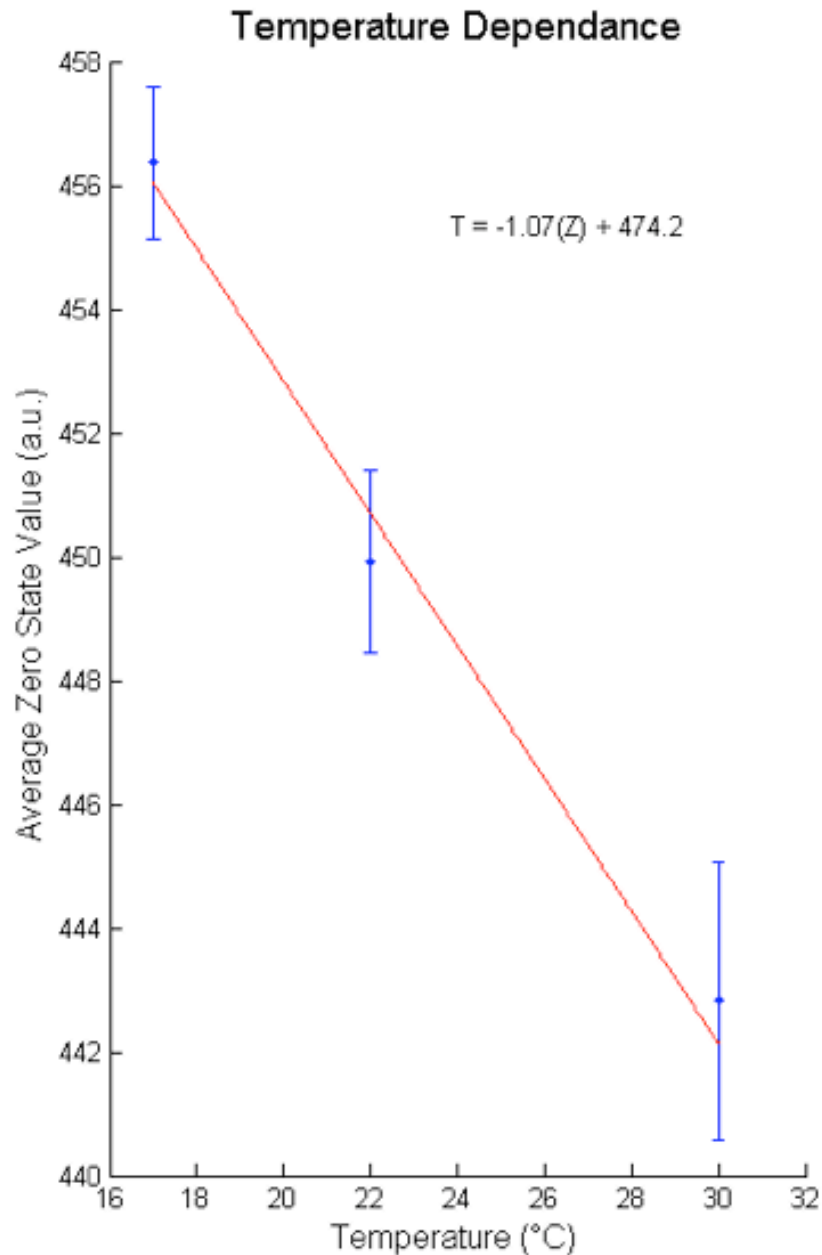
Presentation | Problems

- Gyroscopic Drift
- USB standards are difficult to comply with when dealing with a composite device
- Cases are difficult to build
- Finalizing the interface with limited iterations is difficult in such a short period of time
- You can't please everyone all the time

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Presentation | Problems



Presentation | Future Work

- Improve Case/Buttons
- Re-asses the Interface
- OS Level Configuration Utilities
- Address Gyroscopic Drift Dynamically
- Explore Business Viability
- Consider Production Scale Hardware

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Presentation | Acknowledgments

- Fred Heep - Lab equipment and cables
- Steve Whitmore - Grading guidelines and project repository
- Brad Oldham - Ideas for case and joystick
- Eric Lee - for being Eric Lee
- Umilla Stead - Occupational Therapist, Ergonomics advice
- Judy Bennett - User testing
- Regan Pedersen - User testing
- Lisa Pedersen - User testing

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Presentation | Conclusion

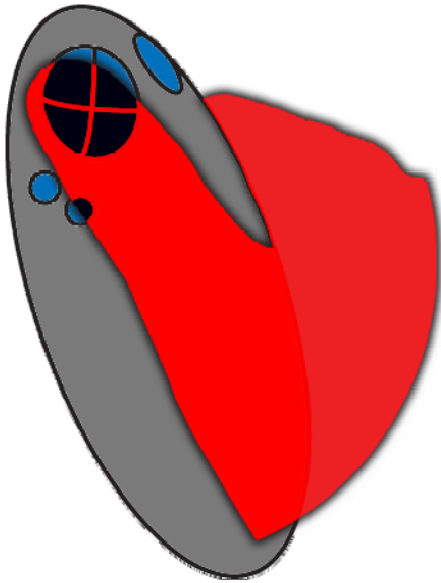
- We've come a long way:
 - we have a working device
 - plays well
 - good start
- What is left to do:
 - Improve reliability
 - Reduce drift
 - Improve interface

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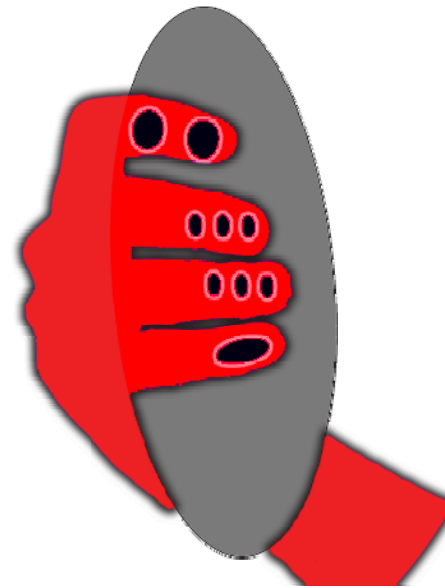


Presentation | InDevil

- Proposed



Top



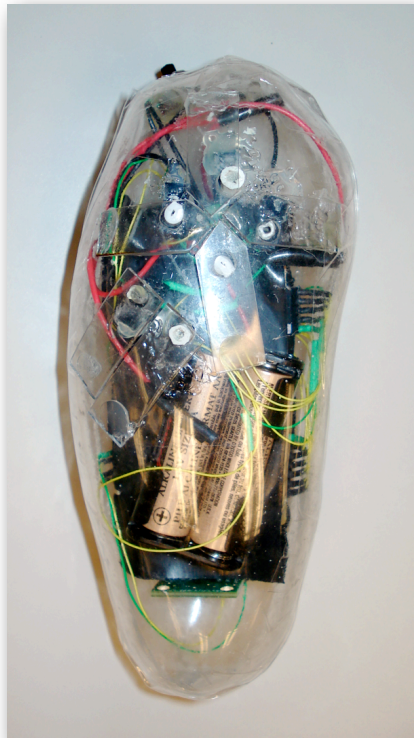
Bottom

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Presentation | InDevil

- Actual



Top



Bottom

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Presentation | Questions

- “

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Presentation | Questions

- “



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Presentation | Demonstration

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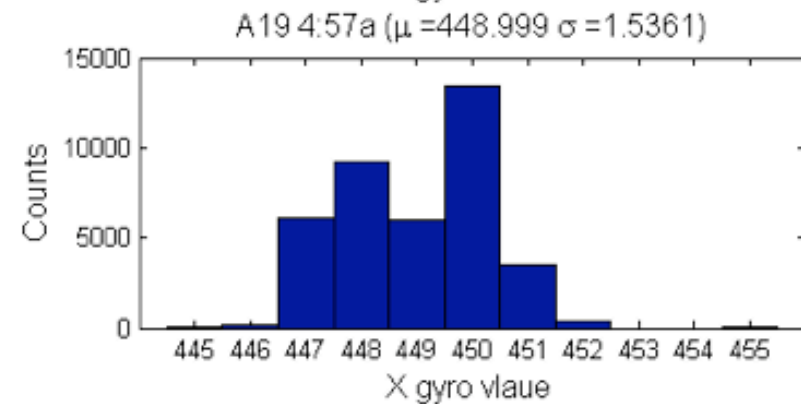
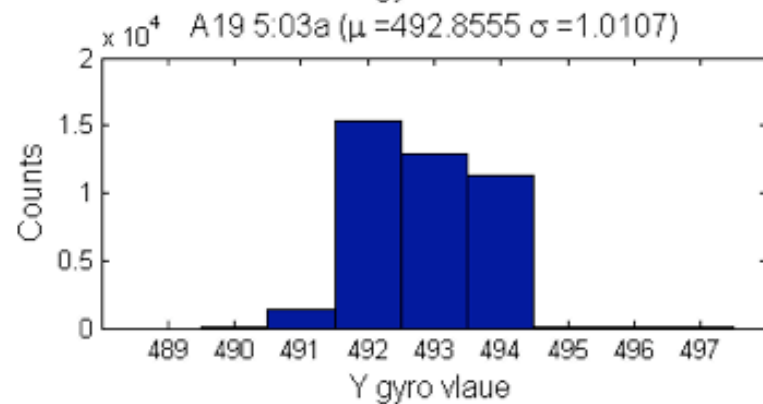
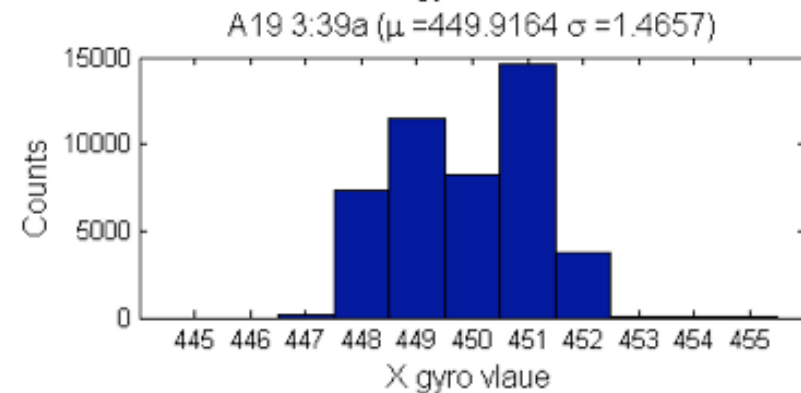
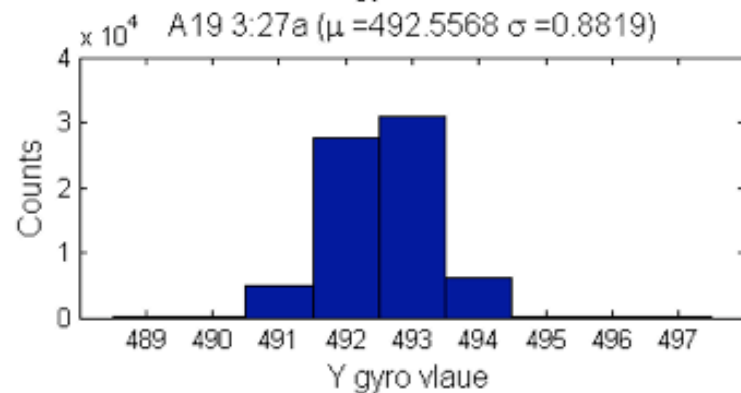
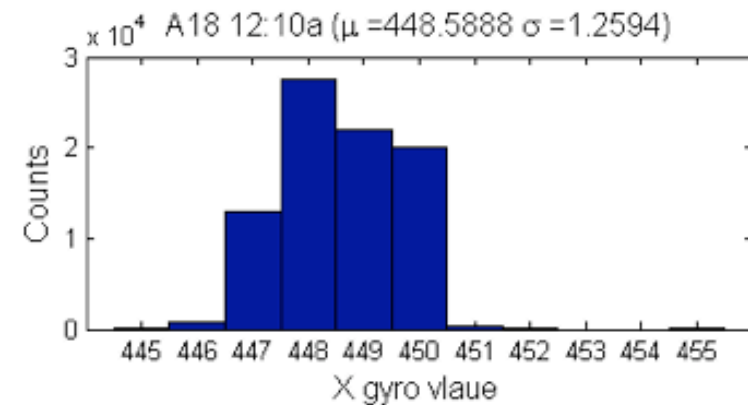
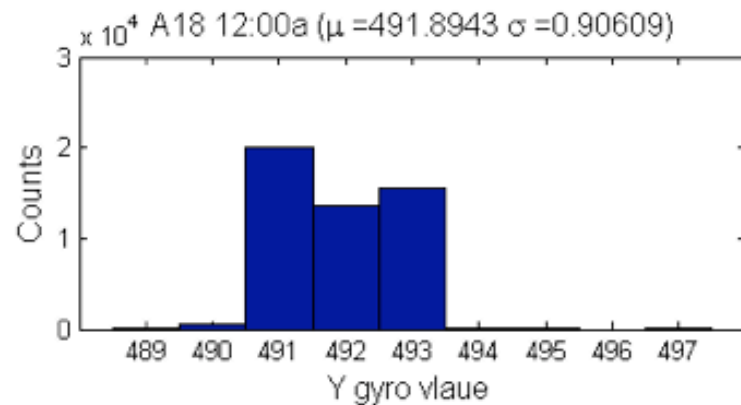
Presentation | Demonstration

WoW!

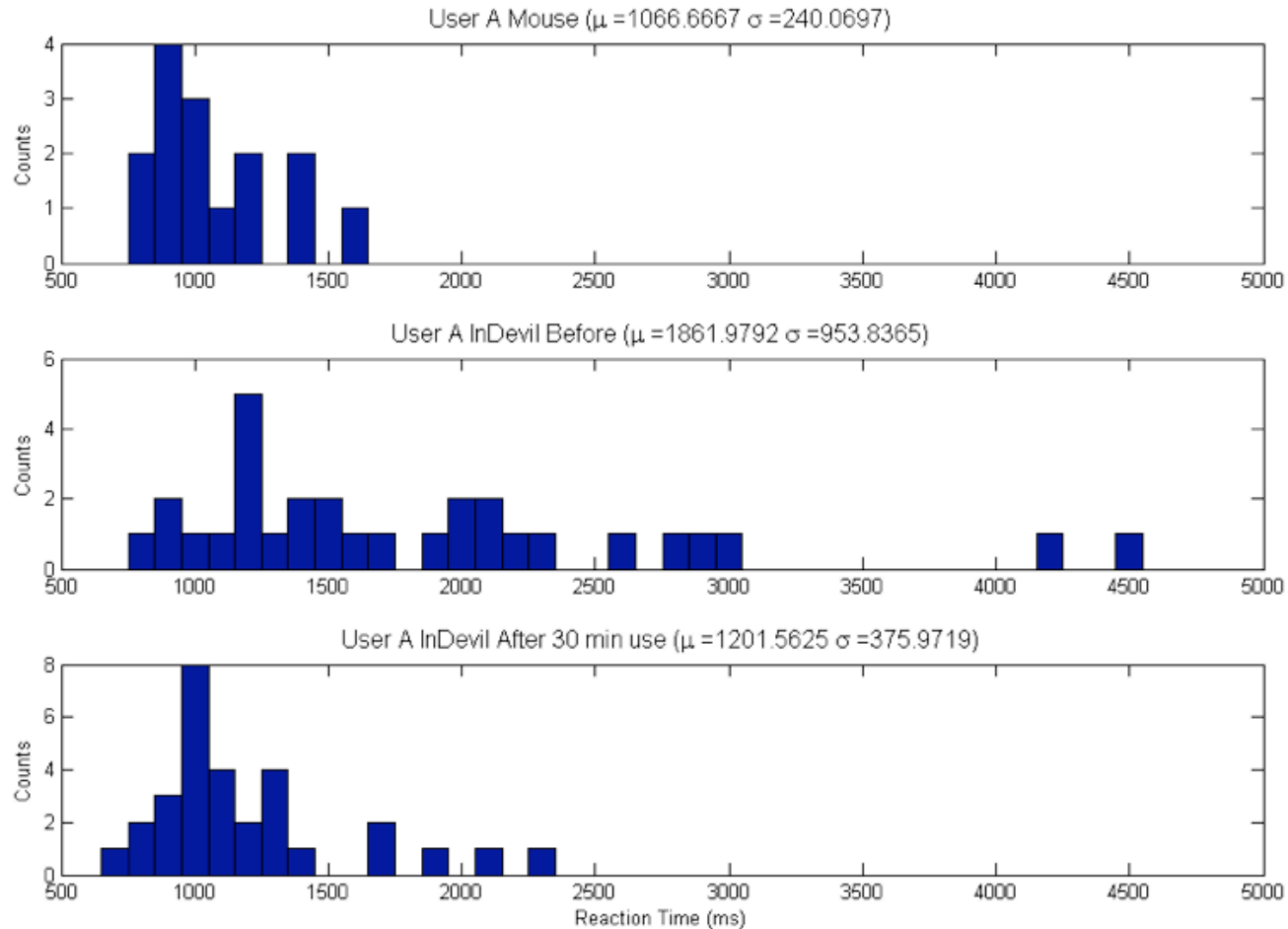
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Presentation | Appendix



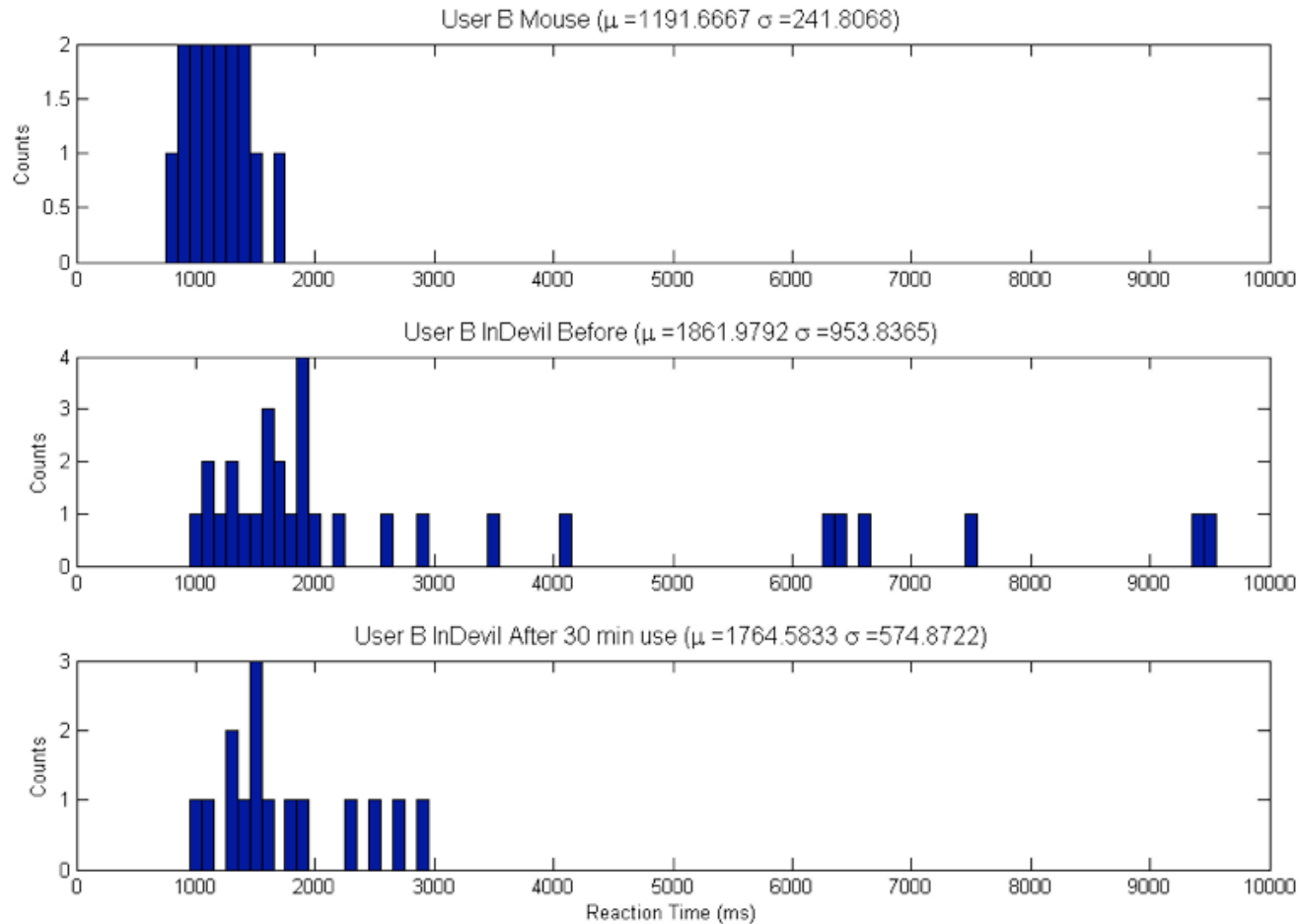
Presentation | Appendix



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Presentation | Appendix



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