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# MetroSwift

2013 Cornell Cup,
presented by Intel

# Students

| | |
|---|---|
| Patrick Simonson | Computer Science |
| Ryan Kalb | Electrical and Computer Engineering |
| Steven Reid | Computer Science |
| David Taylor | Computer Science |

# Advisor

| | |
|---|---|
| D. Kevin McGrath | Instructor of Computer Science |

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# The Problem

Safety

Driver Experience

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# Safety

10 Million Accidents Every Year

34,000 Are Fatal

Complex Interfaces

Many Distractions

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# Safety Examples

Basic Interface

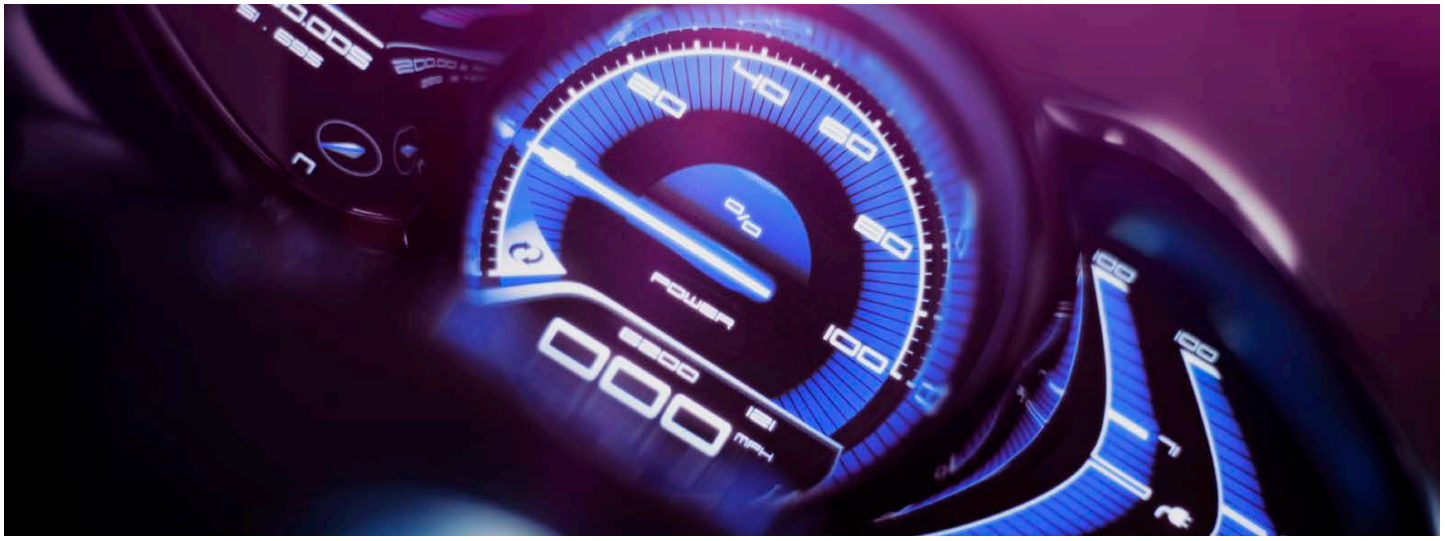
Complex Interface

# Driver Experience

Drivers Expect Features

Want Simple Interface

Minimal Recent Innovation

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# The Solution

Unified Control

One Region

Improved Safety

Updated Speedometer

Reinvented Driver Experience

Gamification

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# Accomplishments

Software Platform

Hardware

Modular Design

Variable Speedometer

Simulator Integration

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# Software Platform

Cross
Operating System
Development

Windows
Embedded

C++

Qt

QML

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# Hardware

## OLED Button Controls

## Steering Wheel

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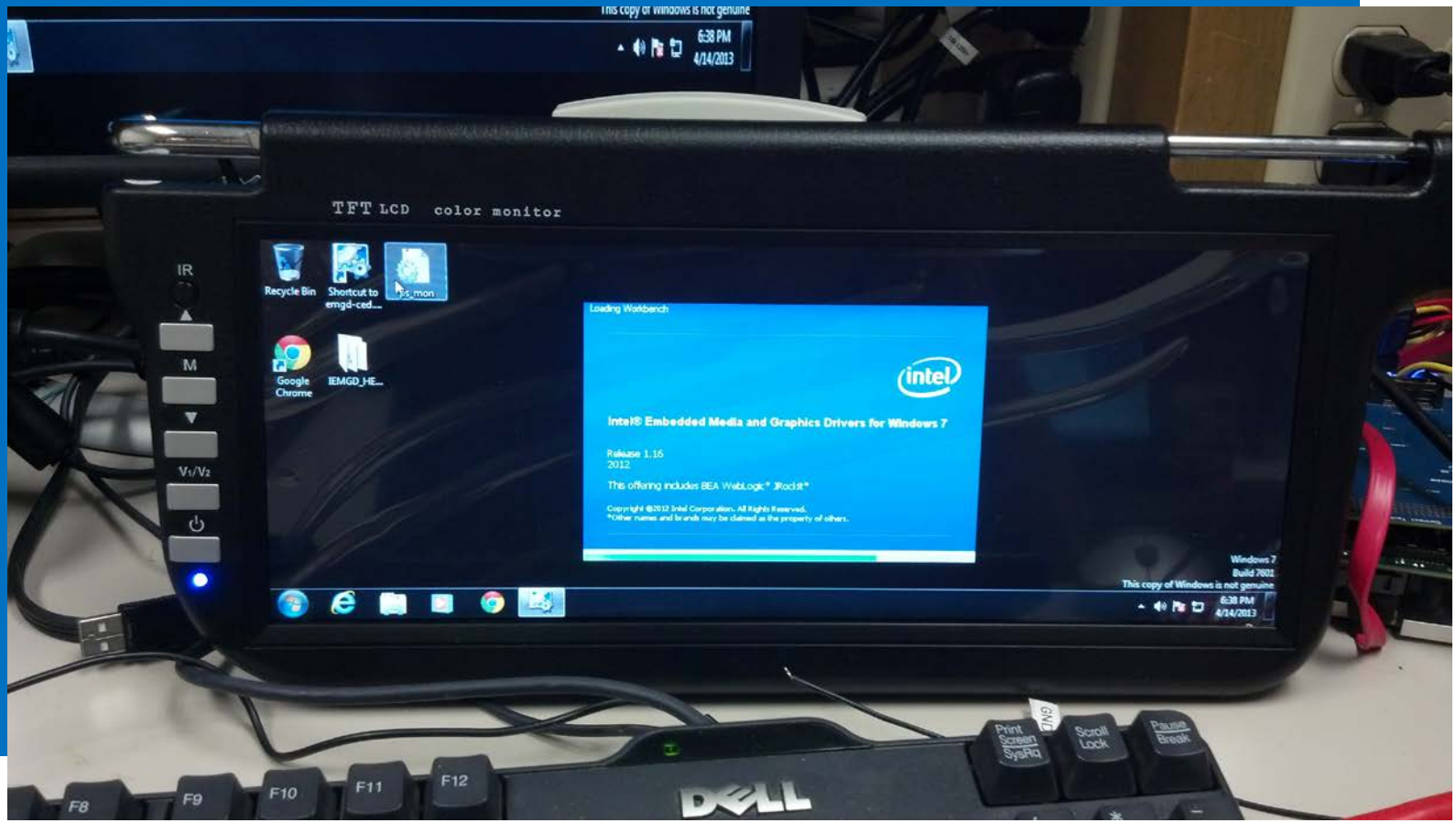
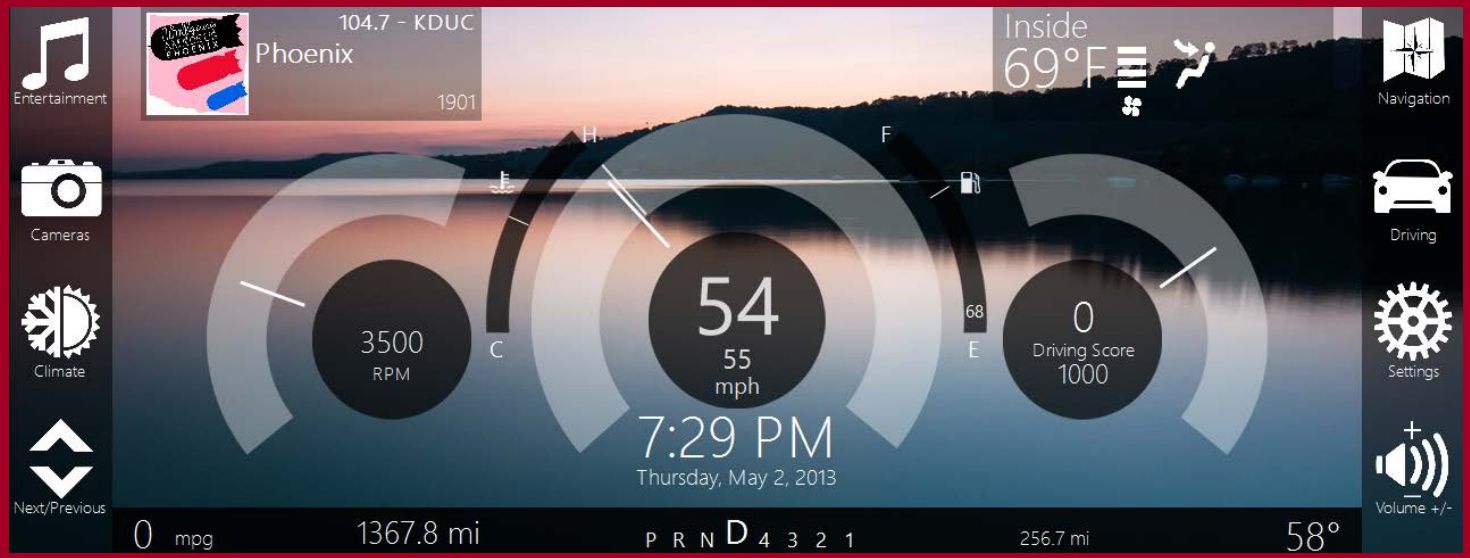
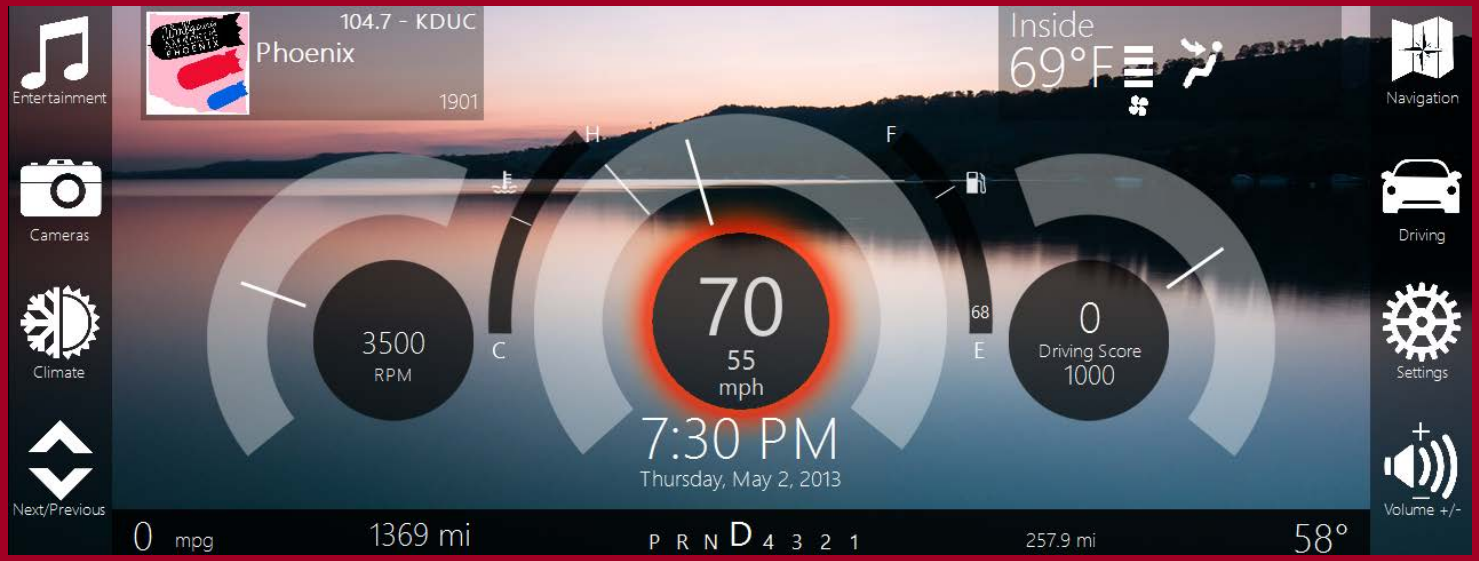
# The Screen

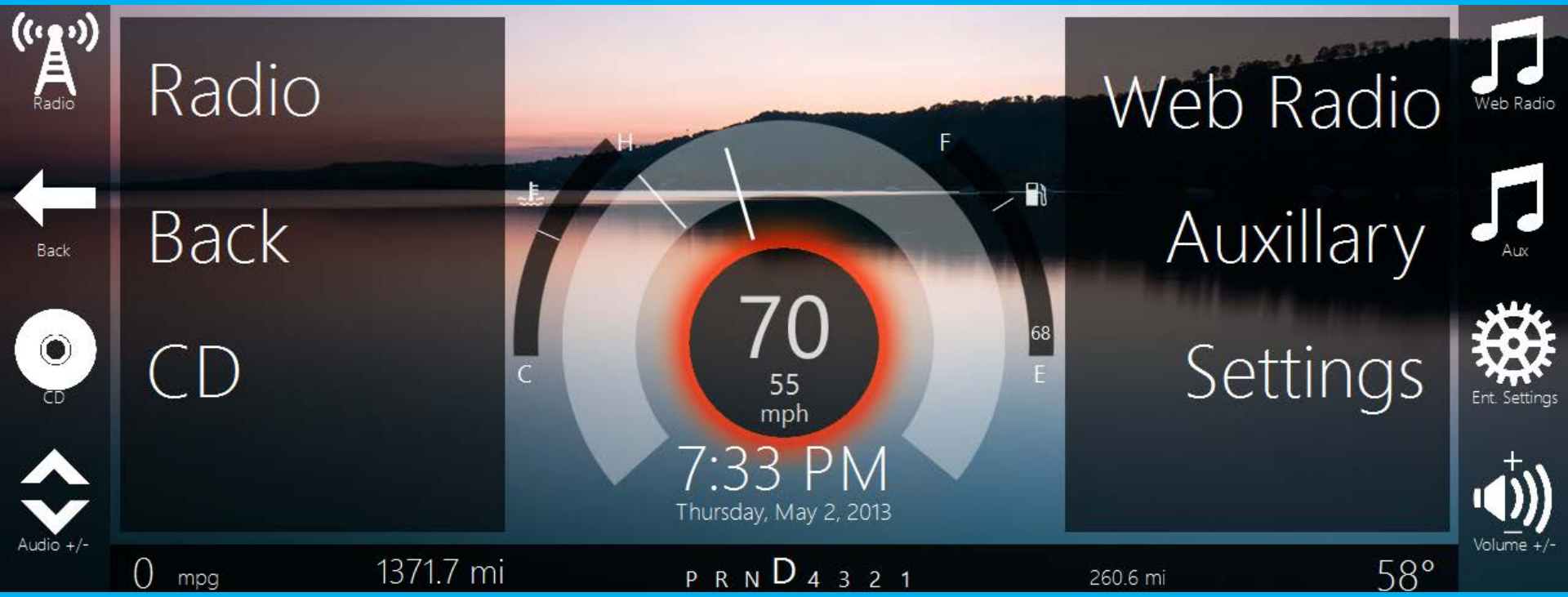

This copy of Windows is not genuine
6:38 PM
4/14/2013
TFT LCD color monitor
IR
M
V1/V2
Recycle Bin
Shortcut to emgd-ced...
igs_mon
Google Chrome
IEMGD_HE...
Loading Workbench
intel
Intel® Embedded Media and Graphics Drivers for Windows 7
Release 1.16
2012
This offering includes BEA WebLogic* JRockit*
Windows 7
Build 7601
This copy of Windows is not genuine
6:38 PM
4/14/2013
F8
F9
F10
F11
F12
Print Screen SysRq
Scroll Lock
Pause Break
DELL

# Variable Speedometer



# Modular Design

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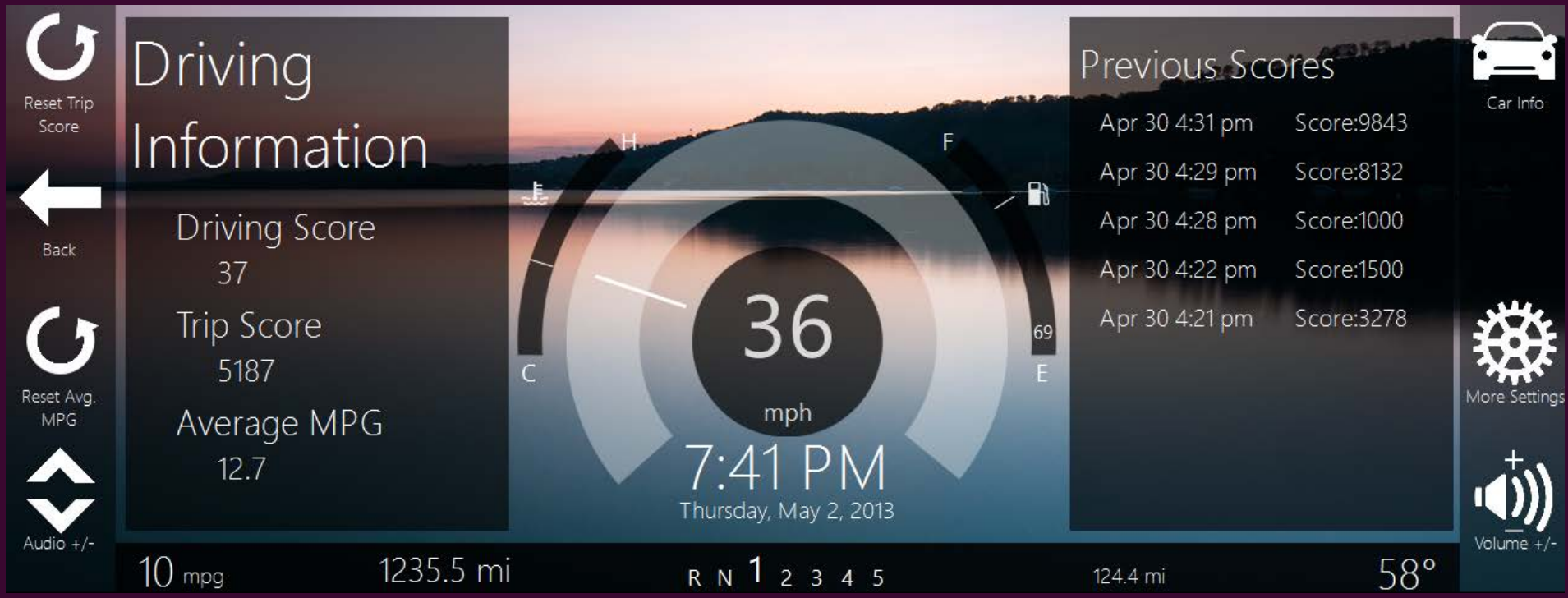
# Gamification

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# Simulation

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# Design Decisions

Low Depth Menus

Six Buttons
Two Rockers

Tactile Feedback

Passenger Interface

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# Challenges

Display

Hardware

Buttons

Data Retrieval & Simulation

Testing

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# Budget

## Funding:

| | |
|---|---|
| Cornell Cup: | $2500 |
| EECS Dept OSU: | $1250 |
| Kevin McGrath | $930 |

## Expenses:

Development:

| | |
|---|---|
| Display Screens | $94 |
| OLED Buttons and Dev Kit | $664 |
| Steering Wheel and Column | $70 |
| PCBs | $218 |
| Misc. Hardware | $148 |

Travel:

| | |
|---|---|
| Airfare | $2558 |
| Hotel | $928 |

Total: $4680

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# Next Steps

- Additional Features
- Vehicle Integration
- Solution Validation
- Smartphone Integration
- Testing
- HUD

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# Results

Usability Studies

Positive Feedback

Muscle Memory

Further Developments

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# Thank you!

Questions?

# Image Credits

Logitech Force Feedback Wheel
http://www.logitech.com/en-us/product/driving-force-gt?crid=714

Tesla Dash
http://image.automobilemag.com/f/features/awards/1301_2013_automobile_of_the_year_tesla

Tesla Interior
http://www.slashgear.com/tesla-model-x-forget-falcon-wings-the-touchscreen-dash-is-geek-cred

Button Rich Interior
http://www.autoevolution.com/testdrive/opel-astra-gtc-test-drive-2012/i-4742.html

Vehicle Accident
http://goo.gl/juHYF

Futuristic Dash
http://munsonsteed.com/wp-content/uploads/2012/07/infiniti-emerg-e-modern-futuristic-speed