Assignment 1 – Proposal

INFR 3380U: Industrial Design for Game Hardware

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Agenda

- Project Description
  - Problem Definition
  - Project Justification
- Design Thinking Process
- Product Comparison
- Planning
- Conclusions
- References

Project Description

Defining and Justifying the Project

Problem Definition

- **Product**: Haptic Glove Lite (HG Lite)
- Haptic Glove for Haptic Feedback
  - No Force Feedback/Movement Restriction
  - Designed for Virtual Reality
- Use in Combination with Other VR Tools
  - Slim, Consumer Oriented Design
  - Low Cost

Justification

- Virtual Reality Industry is Growing
  - Oculus, PlayStation VR, Etc.
- Enhance VR Experience
  - Enhancing Without Changing Playstyle
  - Add-on for Existing Systems
- Ease of Access for Consumer

Design Thinking Process

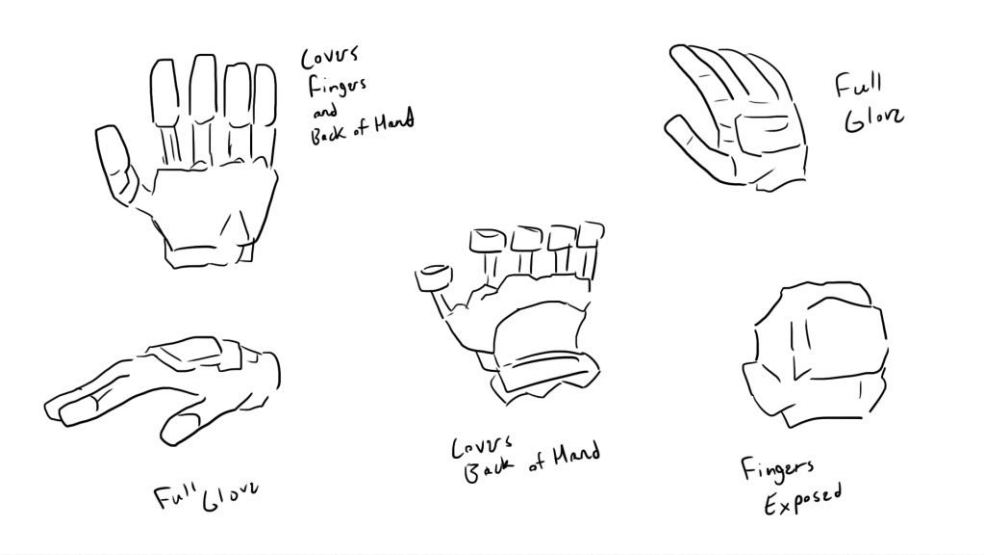
The 5 Stages of the Design Thinking Process

Steps 1 and 2: Empathise and Define

- Virtual Reality is Currently Expensive
  - Prices Going Down in Future
  - Need Affordable Solutions
- Lack of Haptic Feedback Hurts Immersion
  - Lack of Impact and Weight

Step 3: Ideate

- Slim, Lightweight Design
  - Compact Design
- Testing for Different Levels of Coverage
  - Only Fingers, or Fingers Exposed
  - Palm, Backhand, or Whole Hand
- Need to Consider Hardware



Steps 4 and 5: Prototyping and Testing

- Physical Mock-up for Later Assignment
  - Define Look and Size
- 3D Model and Digital Representation
  - Unity Demonstration
- Likely Little to No Physical Testing
  - Concerns Realization of Hardware

Product Comparisons

Product Timeline

Teletact I and II (1990 – 1991)

- Teletact - Early Haptic Glove Prototype Released in 1990
  - Produced by UK National Advanced Robotics Research Centre
  - Utilized 20 Air Pressure Pockets
- Teletact II – Enhanced Glove Released in 1991
  - Improved Air Pocket Density, and Two Pressure Ranges
- Air Pocket Inflation/Deflation for Simulation

Teletact II

Cyber Glove Systems (1990 – Present)

- Haptic System Hardware and Software Company
  - Founded in 1990, Devested from Parent Company Immersion Corporation in 2009
  - Sells Variety of Haptic Products
    - CyberGlove (Motion Capture), CyberTouch (Haptic Feedback), CyberGrasp (Force Feedback), etc.


CyberGlove II & III


CyberTouch II & III

CyberGrasp

http://www.cyberglovesystems.com/

Senso Glove (2018 – Present)

- Started Production in 2015
  - Released First Revision in 2018
- Controller for Virtual Reality and Augmented Reality
- Inexpensive, Ease of Access Haptic Glove
  - Available in Various Sizes

https://senso.me/

HaptX Glove DK2 (2021 – Present)

- Advanced HaptX Glove Announced in January 2021
- Displace User's Skin as Haptic Feedback
  - Additional to Vibration and Force Feedback
- 130 Discrete Points of Tactical Feedback
- High Accuracy Hand Tracking

bHaptics Tact Glove (2021 – Present)

- Slim Haptic Gloves for Virtual Reality
  - Announced December 2021
    - Developer Kits Releasing in 2022
  - Consumer Oriented
  - Hand Tracking Capabilities
  - Haptic Feedback, But No Force Feedback
- Usable with Existing Headsets
  - E.g., Quest 2 and HoloLens 2

Announcement Trailer: https://www.youtube.com/watch?v=dMGnsMccZHU

Planning

Project Plans

Planning – Deliverables and Due Dates

- Assignment 2 – Electronics Prototype – 02/18/2022
- Assignment 3 – Design – 03/11/2022
  - Technical Drawings, Parts, Assemblies, and Simulation
- Assignment 4 – Progress Presentations – 03/18/2022
- • Assignment 5 – Makerspace – 03/25/2022
  - Iterative design and 3D Printing
- Final Presentation and Report – 04/14/2022

Conclusions

Project Summary

Conclusions

- **Project Idea**: Haptic Glove Lite (HG Lite)
- Haptic Components Enhance Virtual Reality
- VR is Expensive – Need Common Use Solution
  - VR Gaming of Interest
- Provides Haptic Feedback to VR Interactions
  - No Movement Restrictions
  - No Hand Movement Tracking

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END

Thank You For Listening