Virtual Reality User Interface

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Team Information

Client
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Faculty Advisor
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Introduction

Motivation
- VR is helpful for engineers to develop their designs.
- A convenient UI is important for engineers to make designs in the Virtual Reality environment.

Intended Uses
- Car Companies
  Test the new cars
- Design Companies
  Make a preview of their designs
- Construction Companies
  Check the new design of their buildings

Intended Users
- Civil Engineer
- Mechanical Engineer

Design Requirements

Overall Objectives
Functional
Allow user to perform multiple engineering tasks
- convenient, useful and easy operation.
- handle occlusion
- It's like a shortcut which store the frequent use function or objectives
- solve the conflict of tool belt with other object.

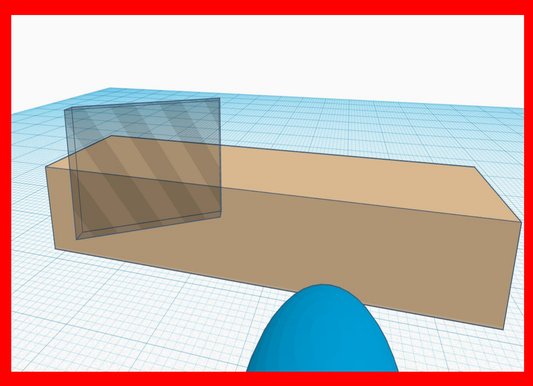
Non-Functional
- No too much objects between two Base stations

Engineering Constraints
- Hardware: HTC VIVE only
- Time: 7 months
- Cost: $500

Most relevant standards
2048.5 - Standard for Virtual Reality and Augmented Reality: Environment Safety
2048.6 - Standard for Virtual Reality and Augmented Reality: Immersive User Interface

Design

Original Design



- Moveable menu
  - Fix anywhere
- Tool belt
  - Contain only tools

- Moveable menu
  - Object
  - Contain multiple functions
- Tool belt
  - Contain multiple objects
- Measurement function
  - Measure any two points

Current Design

Future Work

Future work in this UI
- Deal with occlusion problem with further step, such as transparent front object and highlight the back one
- More functions and features of engineering usage
- Beautify the interface and make it more user-friendly

Future applications applied
- Vehicle design
- Engineering parts design
- Operation Simlulator

Techniques

Hardware
HTC Vive
Controllers
Base Stations

Software
Unity 3D
VRTK Tool Kit