AR/VR Blackjack Assistant

Remote Rendering Application

**Team: ARAnnihilators**

**Membership: UCCS**

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User Roles

● **Project Manager** - Amber Dolezal

● **Communications Manager** - Amy Mejia ● **Logistics Manager** - Austin Hobbs

● **Design Manager** - Stefano Signorelli ● **Math Technician** - Jack Brock

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Overview

● Microsoft Hololens (1st generation)

● Wireless communication (WiFi 802.11AC) ● Blackjack “game” to test

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Rough Overlay Expectation

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Problem Background

**Current Solutions**

● Virtual Desktop for Oculus Quest

● Holographic Remoting Player

● Remote-rendering by gizemdal

**Our Project Differences**

● A standalone game not designed by MS

● Lower delay 

**Possible Out-Of-Scope**

● Ray-tracing

● SDR

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Standards Discussion

Processing Latency

Transmission Latency

Range

Accuracy

Ease of Use

Safe

Sustainability (Hydroelectric Powered?)

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Constraints

● Transmission Delay < 2s 

● Refresh Rate > 75Hz

● Range between Hololens &

Router close enough for full

bandwidth.

● Bandwidth of WiFi Connection

● Power Usage

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Requirements Analysis

● Dr. Semiari is the customer.

● Host computer, AR, object-detection, and power efficiency. ● App requirements versus low system latency and power consumption.

● A Real-World consideration: object-detection and accuracy.

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Requirements

● Accompany a set of documents specifying every piece of software and its functionality

● Allow the AR/VR device will connect to a wifi-router in order to communicate to the host computer

● Perform the app rendering and processing will be done on the host computer

● Improve runtime and battery life

● Allow the app rendering and processing will be done on the host computer

● Identify the playing cards that a person is holding

● Determine the value of the cards

● Display the statistics for next move that the player should perform ● Determine if the player should hit, split, or stand for their next move

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Requirements Analysis Input/Output Analysis:

Microsoft

Real-life

Probability results and

AR Graphical User Interface on Microsoft

Hololens Host computer

player cards

input

AR Graphical User

GUI output

Hololens for blackjack probability statistics.

Interface Example:Chance of winning when:

Hit: 60%

Stand: 40%

Chance of getting a:

1: 0.08%

2: 0.08%

3: 0.08%

4: 0.12%

etc…

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Requirements *Specifications* **Requirement Specification**

Remote Rendering will be done utilizing an AR/VR Device

Remote Rendering and processing will be done on a host computer

Remote Rendering will improve runtime and battery life

The application will display the statistics for the next move that the player should perform

The application will determine the value of the cards that are on the table (player)

The application will determine the value of the cards that are on the table (dealer and player)

HoloLens

The system latency will be under two

seconds

Battery life will be improved by 5-15%

The application will display the probability of success on the HoloLens for each move the player could perform

The application will display a graphic and play a sound on the HoloLens when player hits a card count of twenty-one

The application will play a sound when the player wins the game

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System Design Expectations



Issues 13





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Budget

● Microsoft Hololens (1st

gen) ($810 new on Ebay 

plus $30 for shipping)

● WiFi 6 Netgear AX1800

Wireless Access Point

($40 new on Amazon) 

● Playing Card with Chips

($7 new on Amazon)

● Total price for needed

items is: $887

● Total budget is $1000 to

cover tax when

purchasing.

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Societal Concerns

**● Ethical**

○ It is important that we not encourage or endorse gambling ○ The data retrieved from the AR headset should not be transmitted across unsecure networks

**● Sustainability**

○ Our AR headset is locally sourced, hydroelectric fed, free range and so on. 

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Conclusion

Remotely Rendering an AR/VR Program

Questions?

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References

● Microsoft Hololens (gen 1)

**https://www.ebay.com/p/6010469621?iid=125260999825** ● WiFi 6 AX1800 Dual Band Wireless Access Point

**https://www.amazon.com/NETGEAR-4-Stream-Dual-Band-Gig abit-Router/dp/B097HMLTQX/**

● Playing Cards and Poker Chips

**https://www.amazon.com/Plastic-Playing-Waterproof-Gambli ng-Assortment/dp/B08CBV84LF/**

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References

**●** VR Virtual Desktop

**https://uploadvr.com/how-to-pc-vr-virtual-desktop-quest/ ●** AR Microsoft Remoting Program

**https://hololens.reality.news/news/hololens-can-now-wirelessl y-use-pcs-cpu-gpu-for-faster-development-cycles-0173967/ ●** RTX Project

**https://github.com/gizemdal/remote-rendering/blob/main/REA DME.md**

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