

*Florida International University*  
*School of Computing and Information Sciences*

CIS 4911 - Senior Capstone Project  
Software Engineering Focus

# Feature Document

User Story #837

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# User Story – Add a holographic GUI

- As a user I want a basic GUI so that I can more effectively control events within my painting (removing colors, layers)

## Acceptance Criteria

1. Create basic UI buttons that the user can gaze on and click to affect their holograms
2. Buttons should include
  - a. Creating a new canvas
  - b. Removing a canvas
  - c. Removing color layers from a canvas

## Use case #1 – Use buttons to remove layers from canvas

Tap on button in world to remove a layer on canvas.

## Details

Actor: User, Developer

Pre-conditions:

- “Holo-paint” installed on HoloLens
- Facing a direction with a wall at least 5m away (to start app)
- Canvas active in world

## Description

Begins whenever a user starts the program and has an active canvas

Ends when a user taps on a button to remove a layer from the world

## Post-conditions

Specific layer (mapped to a color for now) should no longer be visible.

## Decision Support

Frequency

- Often
  - User should be able to remove specific layers from the world as they see fit to more accurately interact with it

Criticality

- Medium
  - User experience should be simplified with a GUI for some features

Risk:

- Medium
  - GUI functions can be overwhelming and sometimes get in the way of what user actually wants to do
  - Should be simple enough for a user to understand what each function does

### *Constraints*

Physical device required

### *Usability*

GUI could get too complicated for some features; future story would be to add voice commands as well

### *Performance*

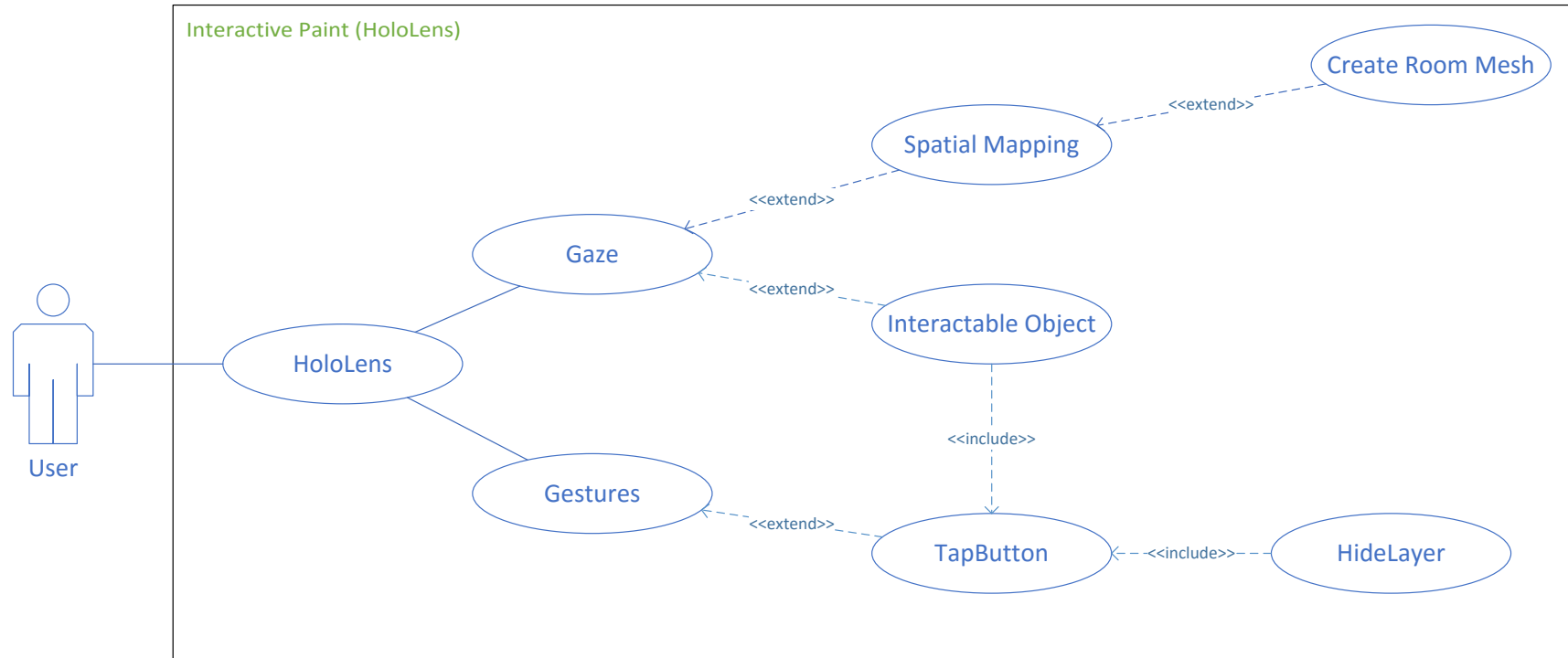
Adding buttons creates no additional performance penalty

Depending on the complexity of layers that rendering is disabled for, performance may actually improve

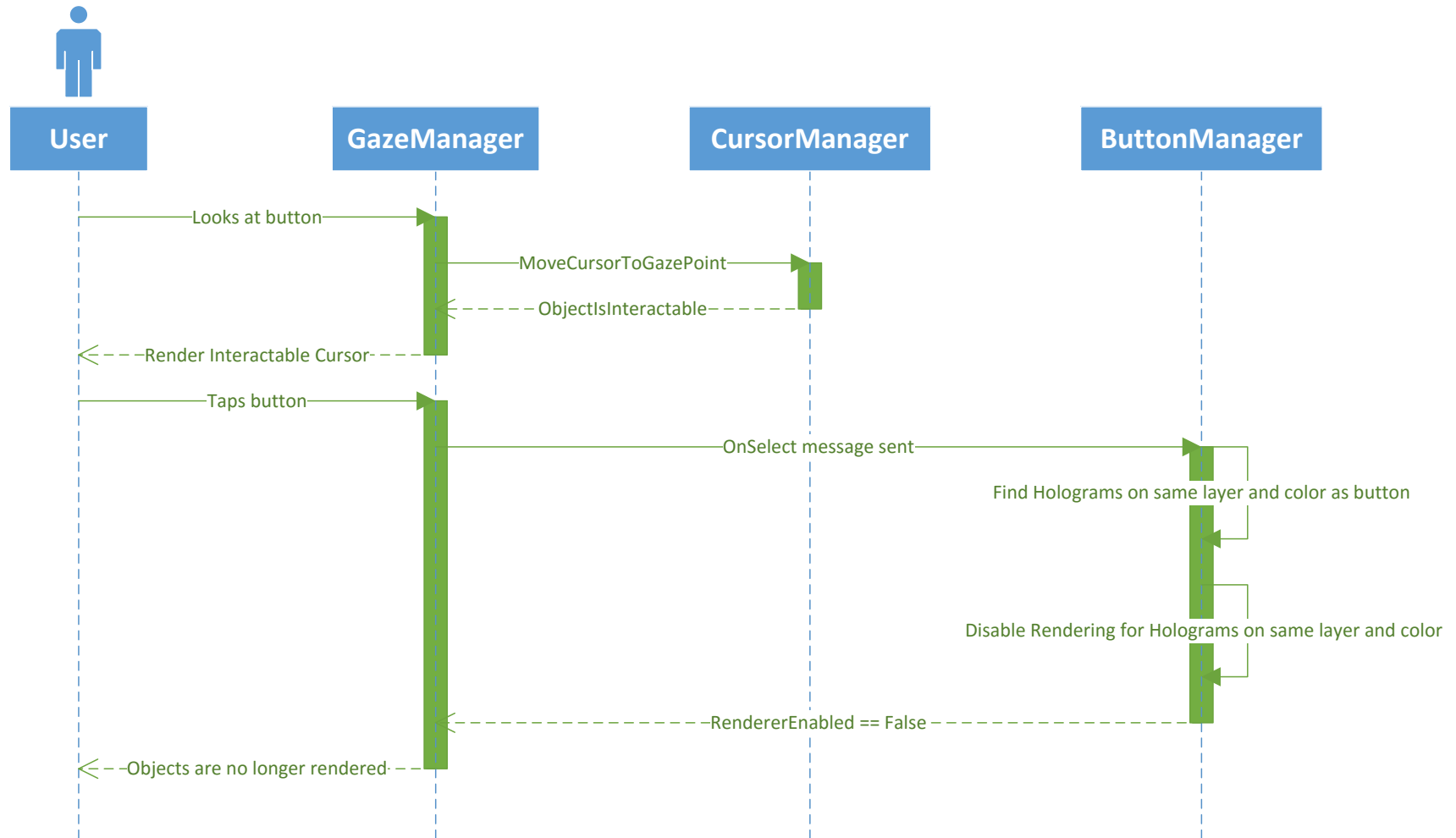
### *Supportability*

Application only works on HoloLens.

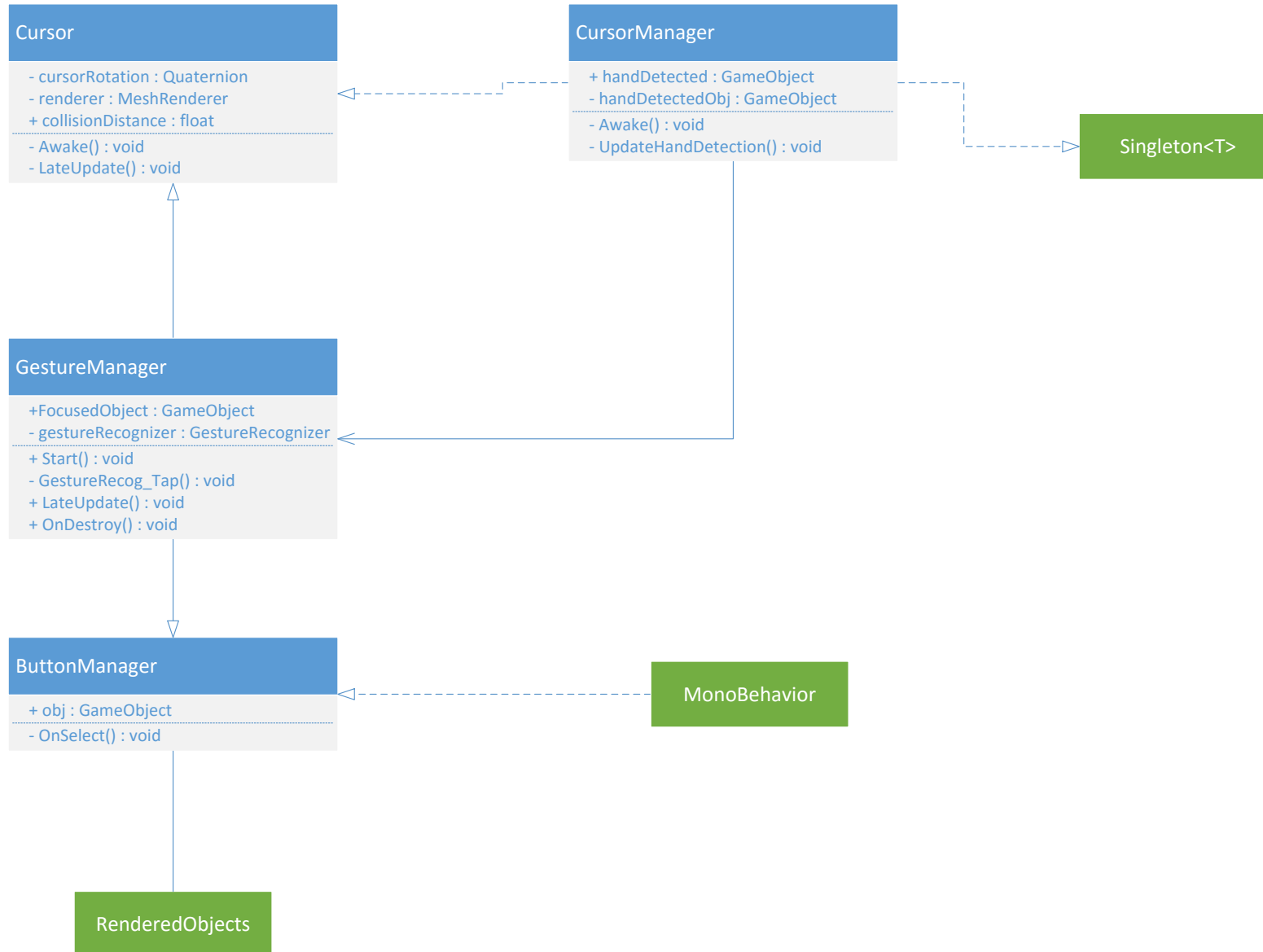
## Use Case



## Sequence Diagram



## Class Diagram



## Unit Test

### ***Sunny Day Tests***

#### Test case

Able to remove specific layer, and recover them

#### Test purpose

User can only remove layers that are active, and tap on the button again to recover them.

#### Test Setup

Program Running, with a canvas up.

#### Test output

Layer disappears when corresponding button is tapped

Any invisible layer comes back when button is tapped again

#### Expected output

Layers disappear and reappear correctly

### ***Rainy Day Tests***

#### Test case 1:

Tapping on a button with no corresponding layer or color does nothing

#### Test purpose

User should not be able to cause the app to arrive at some undefined state if it tries to hide a non-existent layer or color.

#### Test Setup

Program Running

Canvas up

Color red not present in the painting

#### Test output

Nothing happens when user taps the remove red button

#### Expected output

Nothing happens when user taps the remove red button

#### Test case 2:

Canvas should not be able to be moved on top of the GUI, or catch the GUI as the user walks around the room.

#### Test purpose

User should not be able to get the GUI or canvas holograms stuck on each other. Since the GUI follows the user around, it is possible for it to 'catch' on the spatial map and get stuck.

Test Setup

Program Running

Canvas up

Test output

User moves around the room with the GUI not catching or becoming hidden behind the canvas.

Expected output

User moves around the room with the GUI not catching or becoming hidden behind the canvas.

### ***Integration Test***

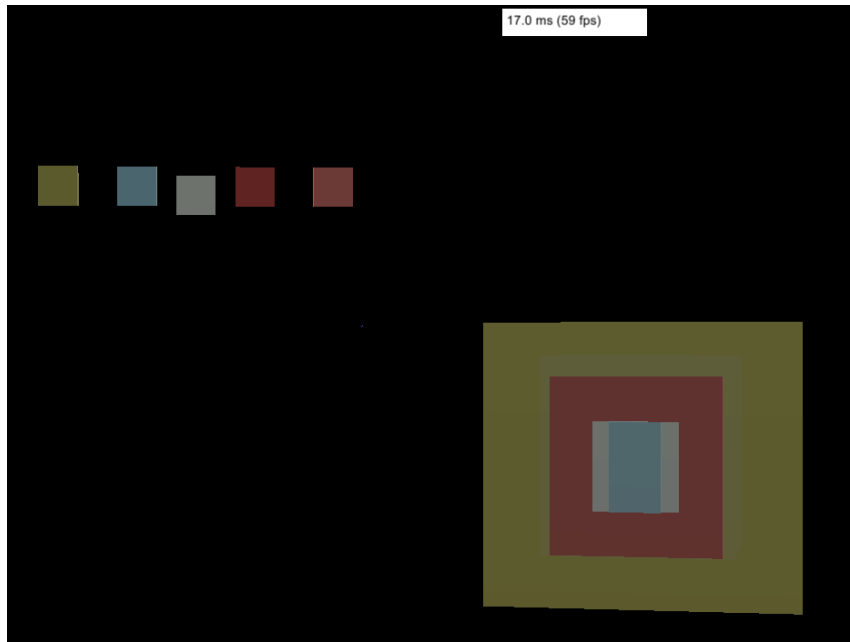
GUI remains responsive up to correctly set max-interaction distance, and rotates to always face towards the user. Menu also follows user around the room without catching on other holograms.



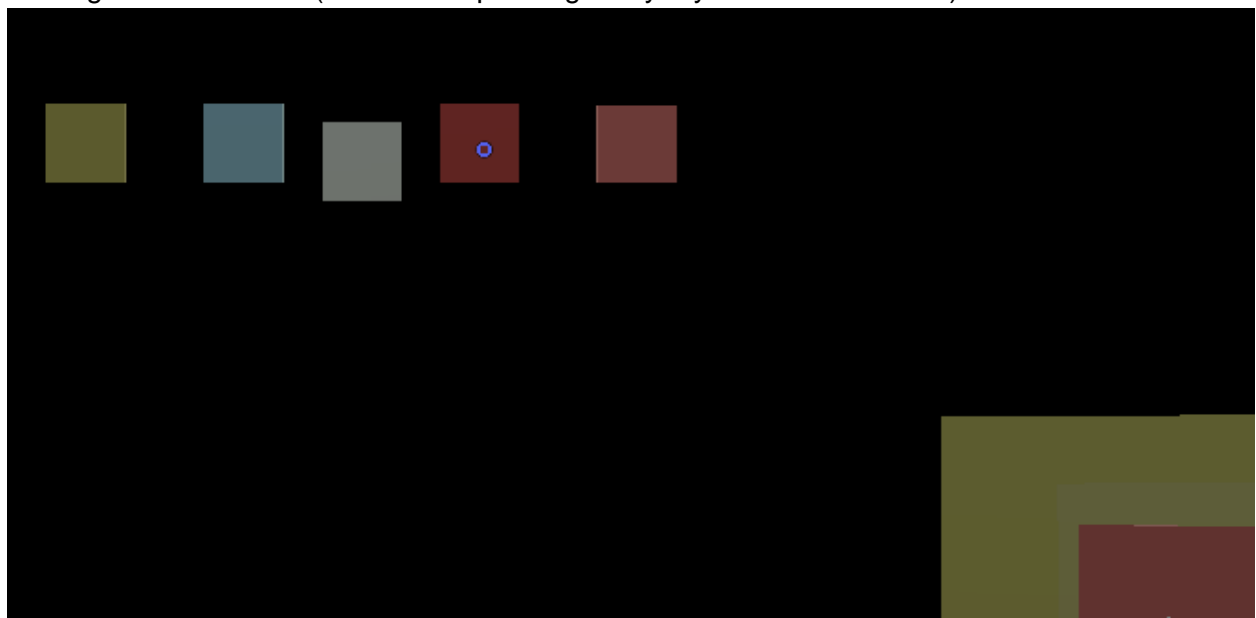
## User Guide

Have open canvas:

Buttons correspond to active layers



Move gaze over button (color corresponding to layer you want to remove)



Button will show as intractable (hollowed circle). Tap to remove the red layer.



Tapping the button again will bring back that layer. (In this case, I removed white and blue, and brought back red)

