Card Game GUI

[Github link](https://github.com/GH-DS/project-JSarasua/blob/main/Docs/Directed%20Focus%20Study%20Project%20Proposal.docx)

# Introduction

The goal of this project is to create a GUI for a card game. Card games require GUI features like drag and drop, scaling, and animations to feel good. In industry there have been more and more virtual card games like Hearthstone, Legends of Runeterra, and Gwent. Also, the GUI features card games require cover many areas that are common in all games. The artifact will be a rogue-like deckbuilding game like Slay the Spire.

# Detailed Feature Description

Features:

Midterm

* Core
  + GUI System
    - Widgets
      * XML based
        + As a programmer, I want the widgets to be built from XML, so that they are easily editable
      * Widgets inside widgets
        + As a designer, I want the widgets to be able to contain other widgets, so that everything is easily contained and managed
      * Basic Widget UI features
        + As a designer, I want the widgets to have basic features like states, properties, and transform, so that the GUI is fully featured
      * Event System integration
        + As a programmer, I want the widgets to be integrated with the Event system, so that the GUI can easily talk with other systems
  + Card game mechanics
    - Cards definitions
      * As a programmer, I want the cards to use Card definitions with basic features, so that cards can be easily created and edited
      * As a programmer I want the card definitions to be generated from XML, so that they can be easily maintained
    - Basic card game operations
      * As a designer, I want the game to have all of the basic features of a card game like draw, play, discard, and shuffle, so that I can easily build the game
    - Mouse controls
      * As a player, I want the game to be easily playable with just the mouse, so that I don’t have to fight the UI to play the game
* Stretch
  + GUI System
    - Widgets
      * Widget Containers
        + As a designer, I want containers like horizontal and scroll boxes, so that I can more easily layout the GUI

Final

* Core
  + Cards definitions
    - As a programmer, I want the cards to use Card definitions with basic features, so that cards can be easily created and edited
    - As a programmer I want the card definitions to be generated from XML, so that they can be easily maintained
  + Player and enemy stats
    - As a player, I want the player and enemy state like health and enemy attack visible, so that I can make informed decisions on my turn
  + Game rules
    - As a designer I want basic game rules like a mana system to force the player to make good decisions, so that the game can have challenge and be more fun
* Stretch
  + Enemy AI
    - As a player I want a simple enemy AI to fight against, so that the game doesn’t get repetitive
  + Slay the Spire-like mechanics
    - As a player I want the game to have features of Slay the Spire like restarting on death, events occurring between fights so that the game pushes me to get better
    - As a player I want to be able to upgrade my deck by add/remove/upgrading cards between fights so that I can customize my deck the way I want

# Technical Issues

Feature:

* Widgets
  + Poorly understood
  + Don’t know what parameters a widget should take and how to keep track of them
  + Don’t know how to edit them
  + Don’t understand transitions between states
  + Writing layout in XML
  + Risk: High
* Card game versus enemy
  + Card Definitions
    - Could be a lot of work if cards are complicated, so I will try to keep them simple
    - Risk: medium
  + Tracking gamestate
    - Player deck, hand, play area, and discard pile/ player and opponent health shouldn’t be too difficult as I have done it before for thesis
    - Risk: medium
  + Playing cards
    - Click and drag using Widget system. Difficulty is on the widgets
    - Risk: low

# Performance

* Rendering complicated UI may cause performance issues
  + Tools to solve: RenderDoc, timing rendering

# Testing

* GUI System Automated
  + I can test the widget transform hierarchies by making sure widgets inside widgets are at the correct location
  + I can test the states by making sure they change correctly
  + I can test a widget with default properties uses its parents
* Card Game Automated
  + I can test to make sure only valid moves can be played
  + The deck to hand to play are to discard pile order is maintained
  + Make sure no cards are lost
* No special software should be needed
* Features to test by hand
  + How the GUI visually looks
  + Rendering GUI pipeline

# Bibliography

You must cite all relevant literature you are using.