



University of Nevada, Reno

# Overlay

## CS 426: Senior Projects

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<https://sanya-gupta.github.io/> and <https://ryandevaney.itch.io/demo>



### Abstract

Overlay is a fun and engaging brain puzzle meant for people of all ages. It consists of a large rotating circle which the user needs to fill by smaller variations of the circle. The player succeeds once the entire circle in the background is filled and is no longer very visible. The game consists of multiple levels which showcase the different circle variations in the display. Each level has a timer to record how long it takes each player to complete the level. The player can see the top ten players on a scoreboard and once again play the game!

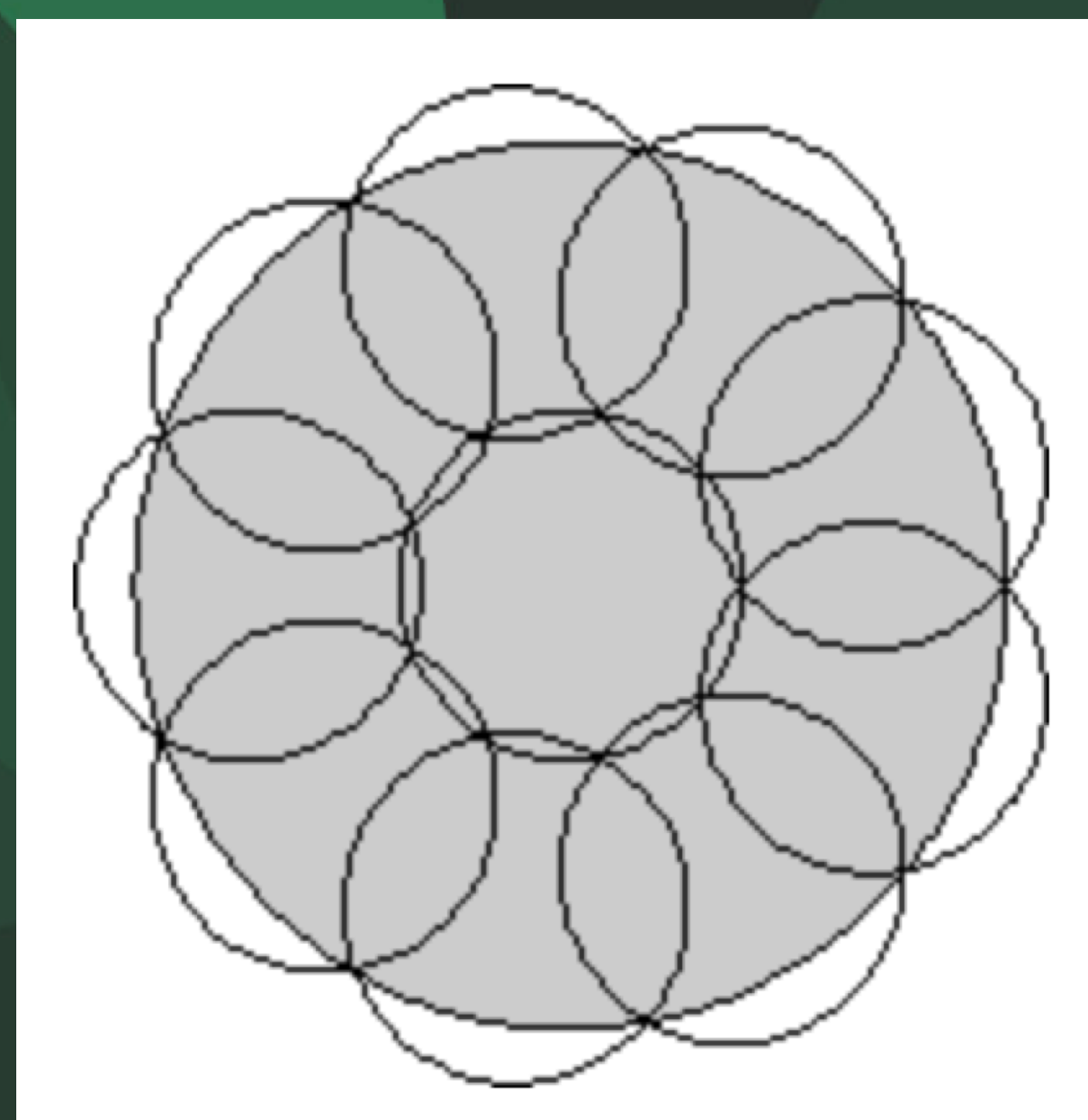


Fig. 1: This figure illustrates the Disk Covering Problem for ten circles.

This project was developed in Spring 2018 as part of the course CS 426 Senior Projects in Computer Science.



### Technology & Architecture

Overlay is created with the Unity Game Engine through the form of scripts written in C#. Unity allows for Overlay to be cross compatible. The web service is implemented in Python 3 with the microframework, Flask. The web service as shown in figure three, allows for the exchange of information between the Unity portion and the scoreboard. It stores and handles the top ten players and dynamically update the scoreboard in the game through JSON objects.



Fig. 2: This screenshot shows the simplistic and "vaporwave" UI created for Overlay.

### Features

Overlay consists of three important features: timer, scoreboard, and circle placement that contribute the gameplay to make it more competitive.

#### Timer

The timer is in the top left corner as shown in figure two, to create the sense of urgency amongst players and is used in calculating the top ten players to be displayed on the scoreboard.

#### Scoreboard

Using the data recorded from the timer, the scoreboard aims to display the top ten players of Overlay through a custom created web service.

#### Circle Placement

The whole notion of Overlay consists of players having to place an allotted number of circles to cover the big background circle. In order to do this the Disk Solving Problem algorithm is used to calculate the size of the smaller circles in relation to the background circle. Figure one shows that the smaller circles need to be placed in a specific manner to appropriately cover the background.

### Future Development

- Implement testing such as automated testing
- Allow for background/UI changes through paid content and therefore implement PayPal API
- Create a scalability service (such as a queues to update scores) in case many people start playing Overlay
- Use an actual database to store user information rather than using the web service itself
- Introduce more modes of challenging gameplay

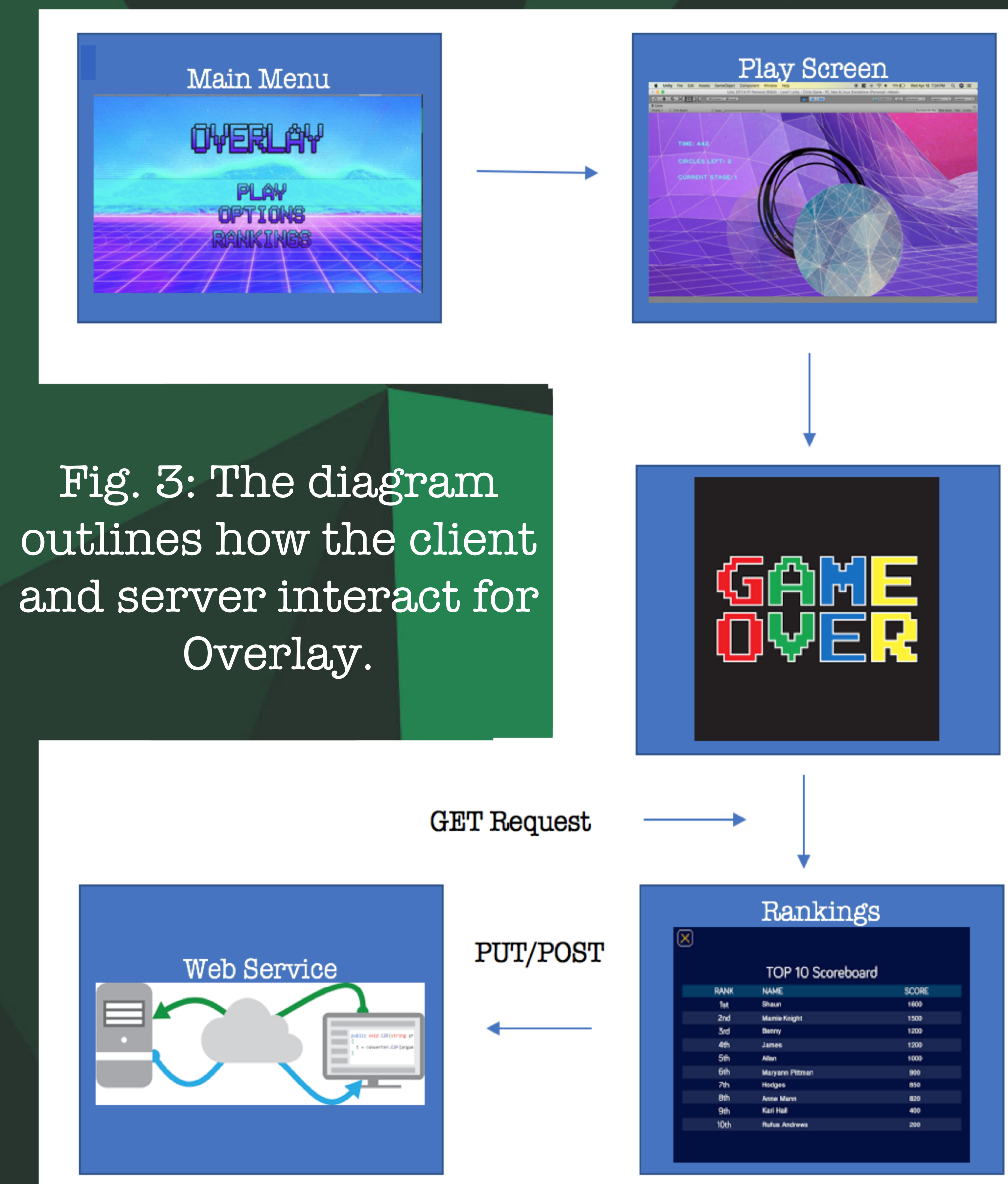


Fig. 3: The diagram outlines how the client and server interact for Overlay.

### Conclusion

Overlay is a challenging, yet engaging game meant for people who want to de-stress and exercise their brain. Developed with Unity and creating custom graphics and scripts, Overlay helps its developers to hone their technical skills in a productive and fun manner. With some polishing and more game mode ideas, Overlay has the potential to be a real success in the game world.