

Video Game Design



Athens, GA

Zibran Vastani & Ethan Loy

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Purpose

The purpose of my game was to create a realistic tennis simulator game. I have been playing tennis for over 12 years and am a state-ranked player, this project served as a medium to combine my passion for tennis and game design to create a game that emulates an Olympic sport.

Description

The game features Realistic animations, carefully reproduced in the game using unity's animation technology, helps the player learn all of the shots used in modern tennis. The court is a realistic tennis court with Wimbledon regulation measurements for the court lines and net height as well as a live audience. Your player can experience a career worthy of a professional through a match against an evolutionary artificial intelligence system that improves the more times you beat it. Decide what strategy to adopt for each match to defeat your opponents. This game's target audience is tennis enthusiasts as well as beginner players who want to take their virtual tennis career to the next level by playing a nigh perfect AI.

How to Play

The controls are relatively simple.

Movement: W,A,S,D

Top Spin: F

Flat ball: E

Mouse click to use the menu

Self Evaluation

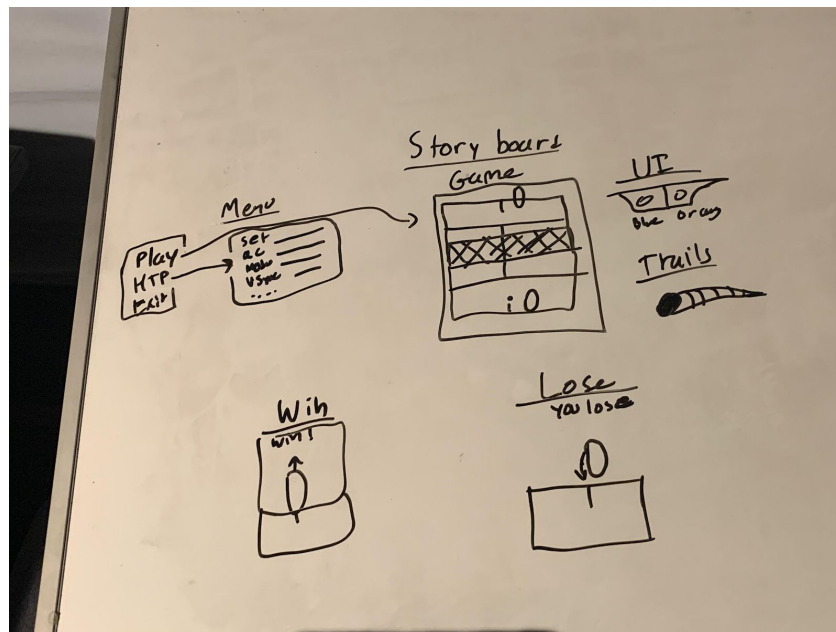
The game is a pure expression of my creativity. To take my passion for a sport I love and transform it into a fully-fledged game was a process that took much planning and many nights designing and bringing the game to life. The game's originality comes down to its origin as it is a personal expression of passion for the sport and its transformation to a functional and playable game. The art was all designed in Blender, the stadium took a whopping 20+ hours to fully make as work in Blender is a complex and tedious process. The programming is the largest part of the program, the game is coded in C# with integrations with the Watson AI API. Unity provides a fully class-based coding structure where all of your scripts and classes are children of the massive unity.engine class. Unity runs in a big loop. It reads all of the data that's in a game scene. For example, it reads through the lights, the meshes, what the behaviors are, and it processes all of this information internally. Each function is called through either cinemachine, to optimize framerate, or unity, to control the game loop. The next big part is the integration with the Watson API. Watson's server is given specific parameters such as controls, goals, and growth rates. For the game's AI its controls are the same as the players, the goal is to return the ball, and the growth rate is one generation per loss. This allows for incremental growth over many generations of play and the playable AI has gone through over 217 generations and is well acquainted with the system and its controls. Overall the game is built to be a fun and enjoyable fusion of sports and gaming that should be fun for all players.

Storyboard

I had the goal of making a fun and creative take on the tennis game and AI provided a path to this goal.

1. Models for player and court
2. Stadium model
3. Ball and racquet collision and physics
4. AI Integration
5. Generation Testing
6. Ball Trails and Audience
7. Run testing and QC

The goal of each storyboarding element was to highlight the best elements of tennis on the planet in specific tournaments and then bring it all together in the end. All Sketches were made by hand on a whiteboard and the full schematic is attached below. This was a rough draft to get my vision on to something tactile.



List of Hardware and Software Used

1. Unity 2019.3f.2
2. Visual Studio 2019 Community Edition
3. Cinemachine 2018
4. Blender 2019
5. All Assets are developed in house and copyright page attached
6. Hardware: Razer blade stealth with gtx 1650 Max-Q (My laptop)

References

All assets were developed in Blender, Unity, or Visual Studio.

VS License: <https://visualstudio.microsoft.com/license-terms/mlt031819/>

Blender License: <https://www.blender.org/about/license/>

Unity License: <https://unity3d.com/unity/activation/personal>

Permission Letters

All Programs are open sources and licensed above

List of items not made by the team

All items and assets made my the team

Student Copyright Checklist

STUDENT COPYRIGHT CHECKLIST

(for students to complete and advisors to verify)

1) Does your solution to the competitive event integrate any music? YES NO

If NO, go to question 2.

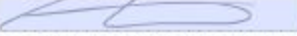
If YES, is the music copyrighted? YES NO

If YES, move to question 1A. If NO, move to question 1B.

1A) Have you asked for author permission to use the music in your solution and included that permission (letter/form) in your documentation? If YES, move to question 2. If NO, ask for permission (OR use royalty free/your own original music) and if permission is granted, include the permission in your documentation.

1B) Is the music royalty free, or did you create the music yourself? If YES, cite the royalty free music OR your original music properly in your documentation.

CHAPTER ADVISOR: Sign below if your student has integrated any music into his/her competitive event solution.

I,  (chapter advisor), have checked my student's solution and confirm that the use of music is done so with proper permission and is cited correctly in the student's documentation.

2) Does your solution to the competitive event integrate any graphics? YES NO

If NO, go to question 3.


If YES, is the graphic copyrighted, registered and/or trademarked? YES NO

If YES, move to question 2A. If NO, move to question 2B.

2A) Have you asked for author permission to use the graphic in your solution and included that permission (letter/form) in your documentation? If YES, move to question 3. If NO, ask for permission (OR use royalty free/your own original graphic) and if permission is granted, include the permission in your documentation.

2B) Is the graphic royalty free, or did you create your own graphic? If YES, cite the royalty free graphic OR your own original graphic properly in your documentation.

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3) Does your solution to the competitive event use another's thoughts or research? YES NO

If NO, this is the end of the checklist.

If YES, have you properly cited other's thoughts or research in your documentation? If YES, this is the end of the checklist.

If NO, properly cite the thoughts/research of others in your documentation.

CHAPTER ADVISOR: Sign below if your student has integrated any thoughts/research of others into his/her competitive event solution.

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