

Dunk It Together

Game Design Document

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General Overview

Dunk It Together is a simple tile-based scrolling platformer game for a single player. The main character is a basketball player who is capable of jumping over cars and dunking on basketball hoops. The general theme can be described as the game is based on regular car road that the character runs on, along with a plain imaginary wall in the background. All of the drawings on the wall (background), as well as the game map, were done using Mappy. Some drawings represent an idea that smoking can be harmful to our surroundings, yet the others are abstractly done with colored tiles. The game, however, is simple to play - using only few keyboard buttons, but can get repetitively annoying along the progress due to its precise collision detections (specially on dunk attempts).

A player begins the game with welcoming screen and starts moving forward with RIGHT key after introduced with simple instruction to start. As they continue, instructions will be displayed in the background as guiding them through gradually. First, player learns when to hold on SPACE for a successful dunk - how much distant from the hoop - because a particular range from the hoop needs to be obtained prior making successful dunks. When player performs a successful dunk, the hoop will switch the colors of its board, and start moving itself. Moreover, simple information text on the top left of a screen displays total dunk attempts, the distance traveled so far, and dunker's alignment with either of the hoops (the closer to 0, the more chance for a successful dunk). As player proceeds and is aware of all the keyboard buttons available already, game gets harder in which user needs to dodge the cars while trying to make dunk attempts. When user dodges cars with UP and DOWN keys, cars will go in slow motion as their speeds get decreased, and get back to normal speed on either of those keys' release. Gameplay is divided into checkpoints, each made with unique actions of hoops. Players also can restart from

the last checkpoint when collided with objects, or when the hoops pass the screen without successful dunk. The goal of a player is to reach the end of a game by traveling as less distance as possible with minimum dunk attempts.

Target System and Requirements

The keyboard keys required to play *Dunk It Together* is Space bar, arrow keys, and LShift (and H for help menu and M for music toggle). Thus, the target systems support those will be Windows, Linux, and Mac OSX (which game was developed and tested on) since Allegro-5 is a cross-platform library.

Story

The story behind how this game was made started with initial thought of how much damage and harm we are producing to the nature on our daily basis. Last year, 2020, made us recognize a lot of environmental issues in our surroundings as we slowed our progresses down and looked at bigger images of certain things. Therefore, I wanted to build a game with multiple chapters, each identifying a significant worldwide problem that most countries encounter everyday; and this game is yet the first chapter of many more sequel chapters possibly built in the future.

Basketball is my most favorite sport, so the personal hobby of mine intersected with the ambition of demonstrating environmental problems made me start building the fashion of a game. This game indicates air pollution problems, specifically in the context of passenger vehicles. Thus choosing cars as colliding objects and the plain background with mostly grey color, and showing random facts related to air pollution were purely based on my initial desire of illustrating an environmental issue.

Theme: Graphics and Sound

Dunk It Together is set in an abstract city in contemporary timeline. The game map including the background was made using an open-source tile map editor Mappy. The overall tone is set to mostly grey, expressing polluted air. The background music of a game is a 8-bit music made by an artist named Adam Haynes, and was downloaded from YouTube (1). The music, in my opinion, gives the feelings of such rushing adventure, while providing little vintage atmosphere due to the fact that it's 8-bit music.

Menus

The game starts with a welcoming screen as introducing RIGHT key to start the game, and keys to open help module (guidance for playing the game), and to switch the background music.

During the gameplay, a player can open up help module anytime by holding on LTRL+H; as soon H key is released the game will continue on from where it stopped. Player can switch the background music on and off by LCTRL+M, yet the the music will begin from the start when turned back on. In addition to prompting user to restart, a random fact about vehicles' emissions is shown on top of the restart menu. The main text colors are chosen to be green and yellow red, in order to stand out from the background as well as to represent the aspect of "green world". Fonts such as retro game font and Tarrget3D font were used for building all the menus (2).

Playing a Game

As the player starts with the welcoming screen shown below, gameplay doesn't start until user hits RIGHT key:



As soon as the game starts , the main actions of gameplay are illustrated below:



Dunk in motion:



If player successfully dunks, the hoop switches its colors while moving:



User dodges cars with UP and DOWN:



When user fails, restart menu comes up as shown below:



Finite states are added to give user feedback - red text - when dodging cars, and when attempting dunks:



Characters and NPCs Description

The main character is an imaginary basketball player with special power of making intense dunks. The character design and the sprite sheet (for dunking and dribbling animation) were created by an artist named Jason Lynch (3). Most of the sprites used in the game, such as basketball hoop, were either edited or were made using Piskel, an online editor for creating animated sprites. The colors of the basketball board is based on primary three colors of my favorite NBA team, Los Angeles Lakers - yellow, purple, and black. The NPCs of the game are uncolored cars in two different sizes - one in the back and the one player interacts with. The sprite for car was downloaded from internet (4). The cars are not controlled by user, but their speed is controlled when player dodges cars with UP and DOWN, helping even when so close to crash into them. Furthermore, pollution smoke and Trump will appear in the game eventually as obstructions; both were downloaded from internet and edited with Piskel (5).

Artificial Intelligence Overview

The game now includes a finite number states that help giving user feedback, depending on their situation, and help improving the gameplay. Two different types of states are added: States indicating if player dodges cars from the close distance, and states relating to the hoop position, and the dunk attempts.

The states of user dodging cars contain only two states: user dodging cars from the close distance, and when user is far from the car - normal state. Each time user dodges cars within the close range, feedback is generated randomly and shown over the player's sprite, such as "Good dodge", "Close one" etc. The bounding rectangle collision detection is used to determine if the user is close to a car.

Two states for dunks are present: REG_DUNK, and LONGDUNK

Within the state of regular dunks, REG_DUNK, if the user dunks from particular range of distance, it is considered as a perfect dunk, and feedback is shown as “PERFECT DUNK”. If the user makes a long dunk - which is considerably hard - it goes under LONGDUNK.

The states for dunk attempts are: TOO_MANY_ATTEMPT, FAIR_ATTEMPTS, GOOD_ATTEMPTS, PERFECT_ATTEMPTS, POOR_ATTEMPTS. These states are based on the percentage calculation of how many dunks user made over the total dunk attempts. For example if the user doesn't make any successful dunks after making 5 dunk attempts, response is shown as ”COME ON, I KNOW YOU CAN DO THIS”. Moreover, if they don't miss any dunks, the state PERFECT_ATTEMPTS shows “2 OUT OF 2 YOU ARE ON POINT”. If the player, however, passes the distance of making successful dunks to the hoop already, it goes under the state TOO_CLOSE and that hoop will automatically move itself without waiting for user to move forward to restart.

Conclusion

As mentioned in the Story section, this game was made to be the start of the many more possible chapters that each can describe unique environmental issue, and each built with different atmosphere and backgrounds related to that problem. For example, the next chapter I wanted to build (if had time) was going to be set in the theme of North Pole in which polar bears will occur instead of cars, to represent the animals that are caused by global warming the most. I hope the concept behind this game is clear to anyone as we need to make our contributions to reducing global warming simply by cutting down the emissions from our vehicles in many possible ways, so that our mother earth can stay healthy.

References

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