LKKB Arcade

LKKB Arcade: Design Document

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60-377: Game Design, Development, and Tools

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December 14, 2015

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1. Game Overview

1.1. Game Concept

LKKB Arcade centers on the idea of an arcade-style, hub-based game, which includes several mini-games to suit different players. This introduces a fun, family-friendly atmosphere similar to Wii Play. In addition to having a different feel, the game offers almost infinite potential for growth due to the concept, as mini-games can be added, and levels can be added to existing mini-games as well.

1.2. Genre

Because LKKB Arcade is based around a hub-world architecture, it really does not have a single genre, but is instead a mix of several genres. With the aspects of bowling as well as air hockey, it could be categorized as a sports game, but also as an arcade/puzzle game with the inclusion of mini-games, *Kitten's Adventure* and *BrickBreaker*.

1.3. Target Audience

The target audience for our game is quite widespread since we have multiple types of games available for play. With a comparison to Wii Sports and games of that style, we feel the target audience has quite a range since Wii can be enjoyed by young players as well as old. With the options of bowling, air hockey, a platformer, a brick breaker game, and a free roam arcade, we believe there is something for everyone.

1.4. Game Flow Summary

The player moves through the game by using a central hub which connects them to the various mini-games. The hub is a bowling alley, with various arcade machines (and of course, bowling lanes) to choose from. In the hub, the character uses a simple control scheme to select the game, and then each game has its own set of controls/objectives.

1.5. Look and Feel

The various mini-games each have their own style, but the game generally favours a cartoony look with minimalistic textures.

1.6. Project Scope

The game features a hub-world and four mini-games (bowling; air hockey; *BrickBreaker*, a classic puzzle game; and *Kitten's Adventure*, a 3D side-scrolling (Mario-style) platformer game.

1.7. Number of Levels

Currently, each game features a single level, mainly to showcase diversity instead of focusing on developing multiple levels on the same game. Different levels could potentially be added to *Kitten's Adventure*, as well as simply adding more games to the arcade.

2. Gameplay and Mechanics

2.1. Gameplay

Mission/Challenge Structure

Each game has its own challenge or objective. The main focus of being in the arcade is to have fun and throw some bowling balls around. As we go into individual mini games, the main goal is fun but the objective is to win the game.

To win the bowling game is to complete it; you can perfectly win the game by getting a score of 300 points. To win in *Kitten's Adventure* you must travel across all the platforms onto the grass at the end of the map. To win in breakout, you must break all the blocks using the ball. To win in air hockey, you must defeat your opponent by scoring 5 goals before they do on you. The challenge in air hockey is to play better than your opponent, whereas the challenge in the other games is to complete and/or perfect them.

Puzzle Structure

Perhaps the most advanced puzzle part of the Arcade comes from the Platformer game, *Kitten's Adventure*. Advancing through the 2D/3D Platformer involves moving platforms that the user is required to travel on. To complicate the matter, some jumps can only be completed by

using the sprint feature. Without sprinting and jumping at the correct times the jumps can be difficult to complete.

Objectives

The objective behind this game is quite simple: have fun. The player has the freedom to enjoy and explore the ambiance of the arcade-themed hub-world. This includes the ability to satisfy the needs of extreme boredom by wreaking havoc on arcade game objects by throwing an unlimited number of bowling balls at them.

2.2. Mechanics

Physics

The physical universe within the LKKB Arcade works according to the regular laws of physics, at least within the confines of the Unity3D physics engine. The only anomaly, however, is the player's ability to throw a series of bowling balls at high velocity to knock over furniture and other game objects.

Movement
General Movement

While within the LKKB Arcade, the player can walk, run, or jump using the outline controls. While bowling, the player has the ability to rotate the bowling ball, move its position to the left or to the right, and fire it down the lane. While playing air hockey, each player moves their paddle by four keys: WASD for the left player, and the arrow keys for the right player. The movement is intuitive to the controls. While playing *Kitten's Adventure*, the player has the ability to walk and sprint back and forth, as well as a couple of arbitrary fun emotes (meowing and scratching head with paw). While playing *BrickBreaker,* the player has the ability to move the game paddle either left or right to prevent the ball from falling, causing it continue bouncing off of obstacles in its path.

Other Movement

The player can freely move the mouse to interact with menus and buttons as needed.

Objects

Picking Up Objects

Players do not have the ability to pick up objects within the arcade, or any of the mini-games except for the *BrickBreaker* game. If the main ball passes through the pink power-up ball, the user gets a wider paddle for 10 seconds. The ball is able to "pick up" the power-up. Also, if *Kitten's Adventure* were to later include more levels, power-ups could easily be added.

Moving Objects

Furniture, such as tables and chairs, as well as the arcade machines, can be moved by having bowling balls thrown at them. This is simply a fun feature that allows the player to interact with the arcade environment in an unexpected way. They even have the ability to knock over the any of the five sets of pins set up in the bowling alleys whenever the arcade is loaded. Beyond the moving objects in the arcade, the air hockey game has three moving objects: each user's paddle is moved and controlled by the user, and the puck is controlled by a constant force in addition to collision with the boards, nets, or paddles.

Actions

Switches and Buttons

Within the Arcade the user can choose to play a specific game by hitting the game area with a bowling bowl and pressing 'E', or by walking up to the game area and pressing 'E'. This is essentially a type of switch which enables when the user is able to interact with a machine. Pressing 'E' will prompt the pre-game menu, where the player can read the controls, exit the menu, or start playing the game. All of these options are selectable by buttons. Within each mini-game, the user can press the Esc key to pause the game, which gives them the options of returning to their game, thereby unpausing it, or returning to the Arcade. These options are buttons as well. As evident, our main use of buttons is through the UI.

Reading

When a player accesses the start menu for a round of bowling or for any of the arcade machines, they have the option of reviewing the controls required to play the game in question. This information can be read after clicking the "Controls" button. Since the information tends to vary in length, it is featured within a scrollable panel.

2.3. Screen Flow

Start Screen

When a player wishes to bowl or play one of the arcade machine mini-games, they must open the start menu before they begin. The purpose of this menu is to allow the player to view the game's controls or cancel and return to the arcade, all before ultimately launching the game.

Pause Screen

Each round of bowling and arcade machine mini-game has a pause menu which can be accessed by pressing the escape key. This allows the player to quit the mini-game and return to the arcade at any time.

2.4. Game Options

The greatest choice in the game is "what game do you feel like playing?" Most of the mini-games are fairly simplistic and don't involve a whole lot of mechanical choices - however, this one choice offers a ton of diversity and in fact changes the gameplay drastically (by changing up which game you're playing)!

2.5. Replaying and Saving

Due to the hub-world nature of the LKKB Arcade, players are allowed to explore and continue playing/replaying rounds of bowling or mini-games for as long as they wish. This also renders the feature of saving obsolete, since there is no significant "progress" being made in this particular game.

3. Story, Setting, and Character

3.1. Game World

General Look and Feel

Once a player finds themselves within the LKKB Arcade, they will immediately recognize the familiar objects, colours, and sounds that surround a bowling alley/arcade facility. This includes bright wallpaper and designs, highlighting the happiness and fun of the

establishment, as well as some relaxed background music that closely matches the family-oriented bowling environment.

Physical Characteristics

Aside from the actual lanes, machinery, shelving for bowling balls/bowling shoes and bowling pins that are set, the other side of the building hosts the arcade features. This is near the exit, where there are tables and chairs for customers sit on top of vibrantly-coloured carpet and arcade machines are scattered across the area for people's enjoyment.

Connections to Other Areas

To bowl or play any of the arcade machine mini-games, players must access them from their stationed positions within the arcade hub-world.

3.2. Characters

Other than the player, there is a bearded cashier that runs the front desk. He is very quiet and does not seem to be a very good employee.

4. Levels

As mentioned previously, the only sense of levels within the LKKB Arcade is the fact that players are able to bowl or play different arcade-style mini-games. Since each of these games similarly follows a point-oriented flow, they are not organized in levels, the length of the game is played until it is completed.

5. Interface

5.1. Visual System

Menus

For each mini-game that you choose to play, there will be a menu that will appear where the player can look at the controls for the mini-game, start the game, or return to the hub. Also when you are currently playing any of the mini-games, at any moment you can press escape and

the game will pause while a menu will allow you to return to the hub or you can continue playing.

Camera

The camera is configured to be in third-person perspective within the LKKB Arcade, allowing the player to explore the hub-world and all of its details. The position and rotation of the camera varies for each mini-game.

5.2. Control System

The player can explore and navigate the arcade with the arrow keys, by running when the left shift key is held, but walking while it is not. The player can also jump by pressing the spacebar while they are running. For the fun of interacting with the physics-enabled objects scattered throughout the environment, the player can throw bowling balls at free will by using the left control key. If a player wishes to start a round of bowling or an arcade machine mini-game, they must press the "E" key to access that game's menu.

5.3. Sound Effects

Each game has their own sound effects associated with them. When inside the hub the only sound effects are if you hit down the bowling pins you will hear the pins hitting each other and the ground. The bowling game also has the pins with the same sound effects. The Kitten game has a jump sound effect. The air hockey game has a sound effect when the puck hits either paddle or the sides of the air hockey table. The collision sound with the paddles is similar but different to that of the boards, and a goal scored (puck colliding with the net) causes a goal siren to go off. The brick breaker game has sound effects when the ball hits the paddle or the bricks.

6. Appendices

6.1. Asset List

Model and Texture List

Using Google SketchUp (popular 3D modeling freeware), we created the arcade machine model, the shelving models, the front desk model, the railing models, and the logo model. Any

remaining models, as well as their textures and animations were downloaded from the Google SketchUp asset store and the Unity3D asset store.

Animation List

There is a kitten with a walking, running, and jumping animation as well as a scratching its ear animation. The main toon character which has a walking, running, and jumping animation as well. These models were used from the Unity3D asset store. There is also a simple animation on the menu buttons that just slightly changes the size of the button as you scroll on the button and press the button.

6.2 Music

Ambient

As you enter the LKKB Arcade there will be some funky music that will play in the background as you explore the place. Each game has its own unique ambience with it. When you are playing the bowling game there will be some relaxing classical music, *Kitten's Adventure* features some heroic music, and the air hockey game has simple background music.

Victory

The *BrickBreaker* game contains a short victory song once you've gotten rid of all the blocks.