

Deca-Cube

Game Design

Version 1.0

April 10th, 2025

Team

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Revision History

Version	Reviewee	Date
1.0	Nick DeLuca	January 13 th , 2025
1.1	Nick DeLuca	February 14 th 2025
1.2	Nick DeLuca	April 10 th 2025

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Overview

Concept

The goal of the game Deca-Cube is to provide a fun yet challenging experience similar to that of older arcade games.

Intended Use

Deca-Cube is intended to be used as a capstone project for the Comprehensive Development Project class at NBCC, for the course Information Technology: Gaming Experience Development. The source code will be open source and uploaded to GitHub for viewing from the public.

Target Audience

Deca-Cube contains bright graphics, lighthearted arcade music, and subject matter suitable for any age.

Genre

Deca-Cube is a top-down, 2D collect-a-thon game.

Gameplay

Story

Robert was a regular person with a regular life. As with any regular person with a regular life, Robert attempted to live his to the fullest. However, his life was cut short from an unfortunate accident involving a car, who swerved to avoid hitting a frog that was crossing the road. As a result, Robert perished, his life unfinished, with plenty of regrets never corrected, and wishes to never come true.

However, upon opening his eyes following the accident, he found himself in a strange world. “Unfortunate,” a mysterious voice spoke, “that your vast potential should be wasted”. Robert was confused yet intrigued. The mysterious voice continued. “Although, perhaps it needn’t be discarded. I am the Geo-Master”. The Geo-Master explained to Robert that he could proceed to the afterlife happily and fulfilled by collecting various mementos from a life that could have been. The catch? Robert needs to prove his willingness to proceed to the afterlife by evading dangerous enemies in the Geo-Master’s domain.

Objectives

The objective of the game is to navigate the cube the game takes place on and collect ten various items without being killed by the enemies hunting you down. The name derives from this objective: Deca, for ten, and cube, for the location the game is set.

Game Progression

As Robert navigates around the cube's faces, the player will gain points based on the items collected and the difficulty associated with collecting them. The easiest items to collect are worth 100 points, and the hardest to collect will be worth 1000, with all the other collectables falling somewhere in between that range. Upon collecting all ten items, the player will have to navigate back to the starting area, which will also net them 1000 points. If the player dies, they will lose 500 of their points, falling into the negatives if their score is below 500. If the player allows Robert to fail five times, the game will end. Whether the player wins or loses, the game will end, the score will be tallied up, and the high score will be saved, along with three initials.

The game will have a timer displayed to the player. Based on the value of the timer when the game is won, the player will receive a score bonus, with higher bonuses being granted for lower times.

Mechanics

Rules

Time

When either the timer reaches 150 seconds or the player collects 5 items, all enemies will increase in aggression. When the timer reaches 300 seconds, the player will lose the score bonus, and enemies will increase in aggression a second time, convincing the player to hurry up and complete the game. This timer persists through the three lives granted to the player.

Collectables

There are ten collectables scattered across the six screens: A photo of a sunrise, an envelope, a ball, a book, a key, a medal, a ticket, a cooking pot, a heart, and a frog. There are some that will be easy to collect, placed in hallways or corners, and some that will be far more difficult to collect. The easier collectables will be worth 100 points, the hardest, worth 1000 points, and the rest will fall somewhere in between that range.

Enemies

There will be eight enemies placed by the Geo-Master to test Robert's abilities: The Charger, The Gunner, The Flipper, The Defender, The Stalker, Sun & Moon, and The Revenant.

Line of Sight

A mechanic that matters most for the Stalker, Sun, Moon, and Revenant enemies. Robert is considered within line of sight if an enemy has a direct, unobstructed view of him. Walls and other enemies count as obstructions, while collectable items do not. The Revenant is a special case, as it can see Robert through walls and other enemies. However, no enemies can see Robert across cube faces, as they count as completely different planes.

Physics

The game is viewed from the top, in a way that allows the player to see the entire plane that Robert is on. Upon reaching a gate to another side of the cube, the game will pause for a moment, switch to the next side of the cube, and play will resume from that side. As Robert moves along the sides of the cube, other sides of the cube will rotate to accommodate the 3D properties of a cube.

Movement

All movement from the player and most enemies is on the x and y axes. The Revenant enemy is allowed movement in all directions. The movements of Robert will be based on the tiles. When the player moves him by pressing a directional key, he will move to the next tile in that direction if unobstructed. Holding the key down allows continuous motion. Robert and most enemies will not be able to pass through walls. The Revenant is an exception to this rule.

Economy

The goal of Deca-Cube is to finish the game with as many points, and as few deaths, as possible. The player achieves points by touching collectables around the cube. The player gets additional points based on how fast they complete the game. The collectables range in point values between 100 and 1000 points, and the time bonus for points can be up to double the player's point value. However, the player loses 500 points any time Robert loses a life. When the game is over, the final point total is displayed, and the player may enter three initials to mark the point total as a high score, which can be viewed from a separate screen.

Characters and Opponents

Player Avatar

The player's avatar, Robert, will remain the same across all three lives: a small, grey diamond shape.

Enemies

Charger

A grey rectangle with spikes that rushes down hallways at a speed faster than Robert. Always rushes to the end of a hallway, slamming into it, then pauses for a moment, before charging towards Robert again.

Gunner

An orange triangle that slowly walks down the halls. Upon being within line-of-sight with Robert, will fire a projectile that will kill him.

Flipper

A semi-circle that likes to hang around intersections where many paths meet. Every 15 seconds, the Flipper will alter its orientation, change color, and swap to the opposite end of the cube. This is a relief when it is in Robert's way, but the unexpected teleport can be dangerous.

Defender

A slow-moving Circle that likes to hang around areas where collectables are. If Robert comes in line of sight of the Defender, it will attempt to catch Robert. If the Defender does not see Robert for 5 seconds, it will lose interest and return to the item it was defending. If there are no items on the Defender's current face, it will randomly move through the area until it finds Robert.

Stalker

A star that stays in one area until seeing Robert. Upon seeing Robert, will attempt to chase him down, but loses interest if it cannot see him for ten seconds. When the Stalker loses interest, it will make its way to another face of the cube and await him there.

Sun & Moon

A crescent and gibbous shape pair. Each will wander around the cube, searching for Robert. When one finds him, the other is immediately aware of his location, and will attempt to ambush Robert. Similar to the Stalker, however, Sun and Moon will lose interest if neither one of them sees him for more than five seconds.

Revenant

A large tesseract that chases Robert down. Only appears after the timer reaches 150 seconds. The Revenant is always aware of Robert's location, passes through walls, and the Stalker, Sun, and Moon will all be alerted to Robert's location if the Revenant is on the same.

Aggression Levels

When the timer hits 150 seconds, all enemies will enter an enraged state, encouraging the player to hurry up. This enraged state is amplified after the timer hits 300 seconds.

Charger

At 150 seconds, the cooldown between the Charger's charges will be halved. At 300 seconds, the speed of the Charger's charges will be halved again.

Gunner

At 150 seconds, the cooldown between the Gunner's shots will be reduced by 2 seconds. At 300 seconds, the cooldown between the Gunner's shots will be further reduced by 2 seconds.

Flipper

At 150 seconds, the Flipper will instead only wait ten seconds to flip on sides that Robert is not on. At 300 seconds, the flip timer is decreased to five seconds.

Defender

At 150 seconds, the Defender's detection duration for Robert will increase slightly. At 300 seconds, the detection radius increases again, to 10 seconds.

Stalker

At 150 seconds, the Stalker will remember the player's location longer after seeing them. At 300 seconds, that duration is further increased, up to 20 seconds. The Stalker's line of sight extends to the Revenant's line of sight.

Sun & Moon

At 150 seconds, Sun and Moon will remember the player's location for longer. At 300 seconds, both of them will be alerted when Robert enters the Revenant's line of sight.

User Interface

Title Screen

The title screen will be simple, black text on a red background. It will display the basic controls for movement and pausing in the game, as well as include small tips for handling the game's enemies. The screen will display three options: "Start", which starts the game, "Quit", which closes the game, and "Scoreboard", which will display the high scores, if any.

Scoreboard

A screen with a red background, that says "Scoreboard" at the top. The screen will have places to display the top scores, along with the initials associated with them. There will also be a prompt to press the "Escape" key to return to the title screen.

In-game GUI

The game's level will take up most of the screen, with small black bars at the bottom of the screen. At the bottom of the screen, the number of lives remaining and time elapsed, and score will be displayed. On pausing the game with the Escape key, the player will see how many items they've collected.

Audio

All audio will be in an 8-bit style. The menu and scoreboard will share a theme. A different song will play depending on whether the player wins or loses the game on the results screen. Lastly, the main game has 6 themes, which change depending on the player's progress. When the Gunner fires its gun, the Flipper changes sides, Robert dies, or an item is collected, a corresponding sound will play.

Graphics

All of the game's graphics will be in 8-bit pixel art.