

FINAL PROJECT REPORT

DESTROYING THE GREAT CATHEDRALS OF EUROPE

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PROF A. GALLER

PROGRAMMING TEAM:

Z. BAKER

D. BLACK

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SECTION 1 - INDIVIDUAL CONTRIBUTIONS

Z. Baker:

Movement and placement of all actors
France and Germany backgrounds.
Primary code generation
Setup data structure through git

D. Black:

Game concept.
Belgium and England backgrounds.
Cathedral images.
Draft pitch document. .
Create and program splash and instructional screens.
Draft game operating manual
Select and program background music

R. Southern:

Project Management
Quality Assurance code correction
Internal Support
Edit game operating manual

B. Wallace:

Create bomb counter HUD display,
Create player image, police bullets, and the player Ninja star
Program alternate WASD style movement controls.
Ammo box collection sound.

SECTION 2 - GAME OPERATING MANUAL.

OBJECT OF THE GAME

The object of the game is to blow up all the cathedrals placed in England, Belgium, Germany and France. As the player proceeds from country to country, the number of cathedrals and police increase. Concurrently, each progressively more difficult level/country has more bombs and/or more ammo caches where the player can reload.

THE WORLD

The game takes place in four levels. Each is a different European country. They are England, Belgium, Germany and France.

TARGETS

There is only one class of target. It is the cathedral class. Cathedrals have icons that have one of three iconic architectural features common to cathedrals. These are a dome, a spire or a tower. Cathedrals are placed in each level/country at random locations with each play.

PLAYER MOVEMENT

The player can move left, right, up and down using the arrow keys or the W A S D keys if the player is more comfortable controlling movement left-handed or ambidextrous. Both sets of keys work all the time and can be used interchangeably.

PLAYER WEAPONS:

SHURIKEN

The player can throw shuriken (ninja throwing stars) by pressing the SPACEBAR. However, the player must be "pointing" at the police to shoot at them. That is to say, if the player is moving up by pressing the UP ARROW key and wants to shoot at a policeman to his left, he must first push the LEFT ARROW key before pressing the SPACEBAR to fire in the direction of the police. Shuriken are not instantly lethal like bullets. The player must hit a policeman twice to kill him. If the player runs out of shuriken, there are weapons caches in each country which allow him to reload when he runs over them.

BOMBS

There are two classes of bombs - Bomb and deadBomb

Actors of the deadbomb class are randomly placed on each level and are those the player must collect. When the player bounding box intersects with it, the deadBomb class is what the BOMBS counter at the top of the world displays. The player is accumulating bombs to use.

Actors of the Bomb class are what the player drops on a cathedral or in the path of a policeman after collecting the deadbomb,

Each bomb class has its own image. If the player is in range of the explosion when the bomb goes off, he will die.

The number of bombs in each level is at least equal to the number of cathedrals in that level. The player must navigate over the bombs to pick them up and can carry any number of bombs at one time..

The player presses the SHIFT key to place a bomb and light the fuse. There is a short delay on the fuse. Bombs will destroy a cathedral if placed on one. Bombs will kill the player if he is in range when it explodes. Bombs will also kill a policeman if he is in range when it explodes. However, if a policeman runs over a bomb *before* it explodes, he disarms it. The disarmed bomb will not explode, but can be retrieved by the player and used again.

PLAYER THREATS

There are two player threats. They are the police and the bombs the player intends to use to blow up the cathedrals.

POLICE

Police are placed in each level/country at random locations. They move either “left and right” or “up and down”. Police constantly check the location of the player and shoot in his general (up, down, left or right) direction. Police cannot shoot diagonally at the player.

Police cannot move through or over cathedrals which limits their movement. But they can shoot through into or through cathedrals so the player cannot hide behind them.

Police shoot bullets which will kill the player if hit. Reload times for the police are somewhat random in each level/country.

Police bullets are instantly lethal to the player. It is quite possible for the player to kill a policeman and be killed by him in the same exchange of fire.

If the player collides with a policeman, the player dies.

MOVING TO THE NEXT LEVEL

When all the cathedrals in a level have been destroyed, a large RED leftward pointing arrow will appear instructing the player to move to the left border and go to the next level in another country. However, the player may hang around in a level after all the cathedrals are destroyed in order to kill any remaining police if particularly bloodthirsty. But the player can still be killed by their bullets and lose the game.

WINNING THE GAME

If the player destroys all the cathedrals in all four levels/countries, he has won and the game starts over at level 1.

LOSING THE GAME

The game is over whenever the player dies. The player can die in three ways. The first is to collide with the police. The second is to be shot by the police. The third is the player can blow himself up by failing to exit quickly enough from a bomb drop location.

SECTION 3 - GAME ENGAGEMENT CONCEPTS USED AND DISCUSSED

The original game concept was and this game implementation is intended to be a satire - a parody of first person shooter video games and a mordant commentary on the human condition. It is hoped that the very nature of the game and its goals will inspire a sly smile and perhaps some guilty pleasure during the destruction of Western Europe's cultural heritage. As such each game engagement concept was designed to operate as if there really were a purchasing or consuming public that earnestly desired or thought it would be fun to destroy the great cathedrals of Europe. When the original game concept was penned in the late 1950's, the likelihood of such a public was remote. More recently we are less confident of such an opinion. This game should probably carry a rating of R for restricted.

GAME ENGAGEMENT:

Several game engagement concepts are used in Destroying The Great Cathedrals of Europe. The first one we will cover is the idea of easy fun and hard fun. This is accomplished in two ways; the first in that the game has multiple levels that increase in difficulty. Secondly this easy and hard fun is reinforced with an easy to understand yet hard to master game play.

Randomness is used whenever possible and feasible in the game. It is present from how all of the actors are spawned in the world to how the police move around and shoot at the player. Even the rate at which the police shoot isn't always the same. This is a very important part of the game, and perhaps most games. Randomness keeps the player interested longer and hopefully we did a good enough job to keep the player returning to it even after he has mastered the mechanics and has won more than once.

The controls should be easy to understand and use. From the very start of the game the controls are explained and displayed with graphics. We also give alternate controls for movement that are common WASD. The player is also instructed on the purpose of the game and the goal of the player. Once the first level starts it should be easy to understand that they need to collect the bombs and based on the title of the game hopefully it won't be difficult for the player to figure out what they should be doing.

Balance is achieved thru the two play styles the player can approach the game. The player can make it their mission to try and kill all of the police, or simply avoid as many as possible and destroy all of the cathedrals and move on. Even killing the police can be done in more than one way, you can in addition of using the Ninja star try and blow them up with a bomb!

Positive and negative feedback is done in two ways. When the player has made all of the cathedrals explode they are given an arrow to keeping going. On the opposite side of that, when the player is killed they get a You Died in black text with a red background.

The core game mechanic is easy to understand and internalize. Although can be a lot of activity on the screen, the only things the player must do is avoid getting shot and gather and plant bombs.

We did not have as much time to devote to the aesthetics of game elements as we wished. The images are simplistic and disguise the amount of time we spent choosing and implementing them. We created many of our actor class images, and sounds. We have a very good looking explosion animation and almost every action in the game has its own sound. Each level has a custom made image.

The game flow was accomplished by all of the aspects discussed above and facilitated by a simple command structure. Even the game's title contributes to the flow. There cannot be much question about the goal of the game once you have read it.

SECTION 4 - MOST SIGNIFICANT CHALLENGE

The most significant challenges we faced when developing this project were primarily of our own design. In order to create a less rote and deterministic game we wanted to implement some sort of random generation of actors for each world. Designing this aspect of the game was both interesting and challenging. How do you make a level random while enabling parameterization of the different random aspects? The player spawn location is set - hardcoded into each country class, but all other actor spawns are randomly determined. I attempted a streamlined solution to this that would be user friendly to anyone attempting to add levels to the game.

All the spawning is handled by the `generateActor()` method in the country class. Each level extends country and calls this method. `generateActor()` takes a string and an integer argument: the actor to generate and the number to create. The rest is as simple as generating a random x and y coordinate within the bound of the world and sufficiently far away from the player character (who, as stated before, is set to a fixed location). The only issue with this is that when generating an actor, there is no good way to determine if that actor is going to overlap with an actor that has already been spawned. There are several ways around this, but implementing them was by far the most difficult part of this project.

How we eventually solved the problem was to cause any cathedrals that were overlapping each other to shift to a new random position until they were no longer overlapping another cathedral. This worked better than expected but was less elegant than I would have liked, however it works as intended without any major issues.

FOOTNOTES/CREDITS:

1. Game concept derived from the novel The Magic Christian (Terry Southern, author) 1959 and the film The Magic Christian (Terry Southern, screenwriter) 1969.
2. Splash page image “church ruin 1.jpg”: © Copyright [Adrian S Pye](#) and licensed for [reuse](#) under this [Creative Commons License](#).
3. Police image: <http://riotsimulator.org/> used with permission.
4. Background images public domain further edited using GIMP and Adobe Photoshop.
5. Cathedral images created in Open Office DRAW.
6. Police bullets, Shuriken and player images created using www.make8bitart.com.
7. Collaboration tools used were:
 - a. Google Docs and Google Drive for reports and real time chat
 - b. GitHub.com for work assignments, issue resolution and quality assurance
 - c. SourceTree for version control.
 - d. GroupMe for real time offline text chat