

University of California, Irvine
ICS 187
“Biohazard”

Project Professor: **Professor Dan Frost**

Design Document
First Iteration

Prepared by: **Neutrino Games**

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Overview

There are many first person shooters out in the market and many are just like the next. We, at Team Neutrinos, understand that this is a very popular genre of computer gaming and we wanted to take advantage of this by creating an FPS but adding a twist. We found that the main difference between all the FPS games available are the locations and environments they are set in, but even this is similar among many games. Vastly popular games like: Counterstrike, Soldier of Fortune, and Rainbow Six all revolve around the counter terrorist or war theme. Other games like: Quake III, Unreal Tournament 2K3, and, the upcoming, Doom III are mainly set in space and about alien combat. We decided that instead of looking far out into our universe, we should look inside ourselves for our game setting and so we came up with “Biohazard”.

“Biohazard” is an action/adventure game set as a first person shooter. You, the player, will be “the Antibody” and the main character of the game charged with the mission to eradicate a young boy’s body of the destructive J-Virus. The game begins with Jason, an average, healthy, 15 year old boy on his way to buy a new computer game. He is walking behind a man that is noticeably ill. He is coughing and sneezing uncontrollably and Jason decides to walk past him rather than in his wake. Unfortunately, this was a deadly mistake because as he walks past the man, he unintentionally breathes in the J-Virus which later leads to the infection.

Meanwhile, in Jason’s mouth, a new antibody has just been assigned by Central Command to guard against oral infection. The player will begin his/her adventure here.

They will play the antibody on its first day of work and although they don't know it yet, it will lead to a huge adventure that will take them to the furthest reaches of "inner space."

The game play for "Biohazard" will have the player enter the mouth and thus, starts the first level of the game. For each level, the player must complete a mission in order to move on to the next level. As the player moves up in the levels, the missions will get relatively harder. Various germs and enemies will be featured in each level for the player to fight off. Occasional power-ups will be strategically placed to help the player along in the missions. Each of the missions takes place in the various parts of the body such as stomach, nose, and throat which have been affected by the virus and thus needs the help of the player to protect the body from further infections.

In order to kill the germs, the player is given a weapon to shoot with and fight them off. Depending on the germ, the player will need to shoot at the enemy a certain number of times by left clicking on the mouse. By using "W, A, S, D" on the keyboard and the mouse, the player may move in any direction to maneuver through the levels. After completing all the missions, the last mission will be for the player to defeat the virus itself with a special type of ammunition given to the player in the previous level.

"Biohazard" will play like most other first person shooters, however it will be supported with a strong and interesting story that many people have not seen in any gaming genre. We at, Neutrino Games, expect our audience to enjoy our product and not only find it fun

to play but also an engaging story to follow. Another interesting aspect of our game is the fact that we are not necessarily creating this game for the male gamer. This game will appeal to the rare female gamer as well because its tone is non-gender specific. Thus, we are aiming for an audience of both genders probably of the teen age group and up.

Game Specifications

I. Rules and Mechanics

Player movement

The player will be able to move forward, back, left and right and jump with keyboard controls. He/she will be able to look around in the world with the mouse. The player will have a weapons arsenal and will use left click to shoot their current weapon. These controls will be similar to the most current first person shooters, using the keys: W, A, D, and S for forward, left, right, and back controls, respectively. The jump action will use the spacebar. The mouse will allow looking in any direction, where pushing the mouse forward will allow the player to look up and pushing back will allow the player to look down. The direction in which the player looks will also be the direction that their weapon will be pointing. Each shot made by the player will move towards the center of the screen. Thus, the player must center their target on the screen to destroy it. There will also be occasions where the player will have to open a valve or set a timer in which they will need to use the “use” button. This action will use E on the keyboard as its input key.

Player Health Meter

A health meter will be displayed on the lower right corner of screen updating the player of their health status. The meter will feature an outline of a pill capsule and be filled with a green bar showing the current amount of health the player has left. Each attack by an enemy unit will lower the bar by an eighth of the meter. When the bar is completely emptied the player dies and the game is over. This will allow the player nine hits before

he dies. The player may encounter health power-ups to regenerate their health meter. The bar will be renewed at the start of each mission.

Another health meter showing the health of Jason will be displayed below the player's health meter. At the start of the game, it will be quite low because it is the height of Jason's infection. During each mission the meter will decrease slowly as the infection takes affect on Jason's health. It will act as a timer for the player so that they complete their objectives in a timely matter. If this meter is completely depleted the player loses and the game is over. However, as each mission is completed, Jason's health meter is increased an eighth of the bar, thus, the threat of not finishing the objective in time is only in the beginning of the game.

Weapons

The player will have a single weapon, a plasma gun which will not require ammunition throughout the game. The discharge will be white blood cells attacking the invading bacteria when the player shoots them in the right direction. Midway through the game, a story element will have the player pick up a medication capsule which will upgrade the player's weapon so he/she will be able to complete the final mission of the game.

Power-ups

The player may encounter various power-ups throughout the game. The most common power-up will be the health regenerator. Each health power-up will increase the player's health meter by a fourth. There will be two additional power-ups available to the player.

One will be a shield which will make the player invulnerable to any attacks. It will only last for 45 seconds but should aid the player in advancing heavily guarded areas. The second power-up will be a damage amplifier that doubles the damage of the player's weapon. This power-up will only last for 30 seconds but will allow the player to reduce the amount of enemies they face.

Game Ending

There are really only a few ways for the player to end the game. The player can deplete all their energy and die which will end the game without the ultimate goal achieved. Another way the player can end the game is if he/she takes too long to complete their mission. The health meter displaying Jason's health will decrease slowly during each mission. However, this will proceed very slowly; the only real risk of the player ending the game this way is highest in the beginning missions of the game. Or the player can proceed successfully through all the missions and face the final infection at the end and defeat it, in which case, the player will have won and the game will end. Full development would allow the player to save his/her progress during the game but we do not anticipate implementing that feature of the game during this software cycle.

Game play

The player is an antibody set inside the body of a 15 year old boy, named Jason. He will start the game a healthy teenager but very quickly he will be overtaken by a serious infection that the player must defeat. The player will fight the infection in various parts of Jason's body, the mouth, nose, nasal passages, throat, tonsils esophagus, and lungs.

This environment should have a biological “look” and the atmosphere should be hazy. The objective of the player is to destroy bacteria that will be lurking around the mission world. The player will have to shoot the attackers and depending on the character, they will require a different amount of hits to effectively kill the attacker. When an enemy is destroyed, it will flicker and fade away. At various points during their missions, there will be voiceover briefings updating the player on new objectives. This will be accompanied by text in case the player does not have sound available to them. The physics we’re using for this game will be the same as standard physics where there will be normal gravity and liquid splatter.

II. Music and Sound

Music

The music we will be using for this game will probably be of the techno genre but will most likely be looped throughout the missions. We will not be composing an original score for this game.

Sound

The sound will either be recorded by our group or, if possible, found online and used in the game. Sounds will mainly be of an atmospheric nature and will include, but not be restricted to: laser shot, power-up pick up, a damage shot, jumps, jump landings, turning valves, etc.

III. Background Story

Jason is a healthy fifteen year old living in Irvine, California. Like many other teenage boys, he enjoys playing video games, specifically, computer games. He has spent many hours buying and updating his system so he can play his games with the latest in computer gaming technology. On one of his usual trips to Fry's, a computer electronics store, he walks behind a man that seems to have a cold. But this is no mere cold; Jason doesn't know it yet, but he's breathing in the airborne J-Virus, a malicious organism that eats away at internal tissue.

Meanwhile, inside of Jason's mouth, an antibody has just been assigned to his first task as frontline defense against oral infection by Central Command. The J-Virus infection will block Central's ability to create more antibodies to help in the fight. The antibody will have to fight off the deadly infection facing germs of all forms before ultimately destroying the dreaded J-Virus...alone.

IV. Characters

The Antibody

This is the main character of the game that must fight off the infection that has invaded Jason's body.

Jason

This is the environment the antibody will be fighting in. Jason is an average 15 year old boy who gets infected with the J-Virus which the antibody must eliminate before he succumbs to the disease.



Concept Art of J-Virus

J-Virus

Two headed female organism that infects Jason's lungs. She mutates rapidly and kills tissue without a second thought. She attacks cells by biting through the cell membrane and extracting the nucleus while the cell is still alive. She sets up an infection by creating an egg sac that continually generates germs to defend her territory. These germs spread the infection throughout the body and mainly along the respiratory system. The only way of defeating the J-Virus is with penicillin ammunition.

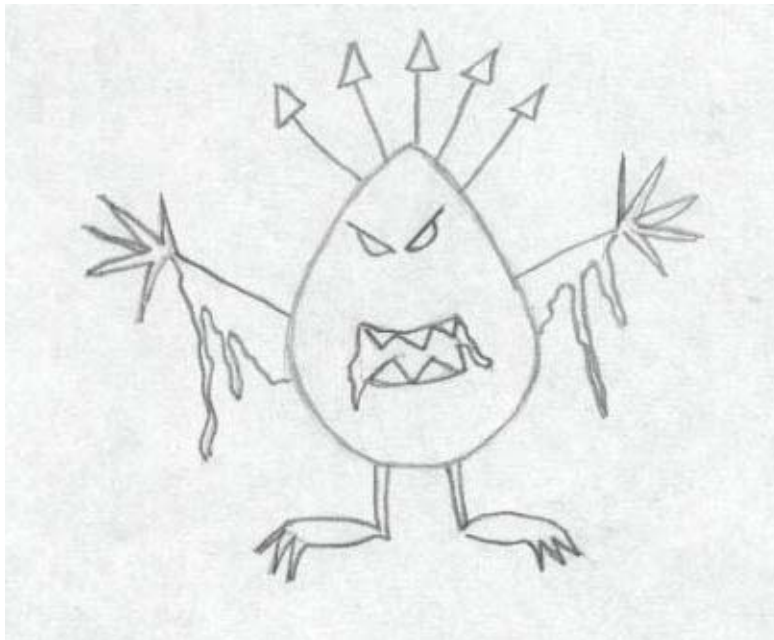


Concept Art of Grunt

Enemy Germs

Divided into three tiers, these are the J-Virus' warriors that the antibody must defeat before it can reach their leader.

Grunt Germ: the weakest of all the germs, this warrior is only capable of hand-to-hand combat. Although they are weak individually, they are overwhelming in numbers.



Concept Art of Major Grunt

Major Germ: a mid-level germ, this warrior has a firing attack that is considerably stronger than the Grunt's. This germ is a substantial threat to the antibody however not undefeatable.

Germinator: the highest order germ, this warrior has a strong cellular membrane and a long range firing attack that is quite capable of killing the antibody. The slow pace of the Germinator is the only advantage the antibody has in gaining the upper hand.

V. Levels

A brief note on the missions: these missions are the main missions we would like to implement if we had the time to do so. But by our estimates we will only be able to develop a portion of these missions for our project. Thus, the missions we plan on completing will be marked by an asterisk (*).

*Mission 1: Infection **

Setting: Jason's mouth, along the surface of the tongue.

Objective: You are a new antibody assigned to defend Jason from infectious diseases by Central Command.

Description: The antibody will start the mission out while Jason is still healthy. As the mission proceeds, there will be a few Grunt Germs advancing on the antibody that he will be able to defeat quite easily. Then all of sudden, a huge wave of the Grunts will invade which will overwhelm the antibody. He will survive the attack but he will have failed his objective because Jason will be infected after this mission. The J-Virus will block Central Command from producing anymore antibodies to help fight the infection, which means he will have to fight off the infection alone. Central Command will still be able to communicate his objectives to him throughout his fight.

Mission 2: Fever

Setting: Jason's brain, around the base of the brain, near the Hypothalamus.

Objective: Jason's hypothalamus is under the control of the Grunts causing blood to rush to his head and giving him a fever. The antibody must eliminate all Grunts around the

Hypothalamus and reset it to bring Jason's fever down.

Description: The antibody will start the mission near the Hypothalamus and advance on the area while eliminating Grunts on the way. Once the area is secure, it must push the reset button located on the Hypothalamus. This will allow the brain to readjust Jason's body temperature so that his fever subsides. The antibody will be given a secondary objective, which will be to assist in bringing down the fever faster. It will need to find three veins in the area and open their valves, releasing the blood from the brain.

However, these will be guarded by additional Grunts.

Mission 3: Stuffy Nose

Setting: Jason's nostrils, within the nose but close to the nostril.

Objective: The mucus in Jason's nasal passages have been infested with Grunts, so much so, that Central Command feels Jason should just blow out all the infected mucus. The antibody must find the emergency release lever and break the membrane holding the mucus in the nose.

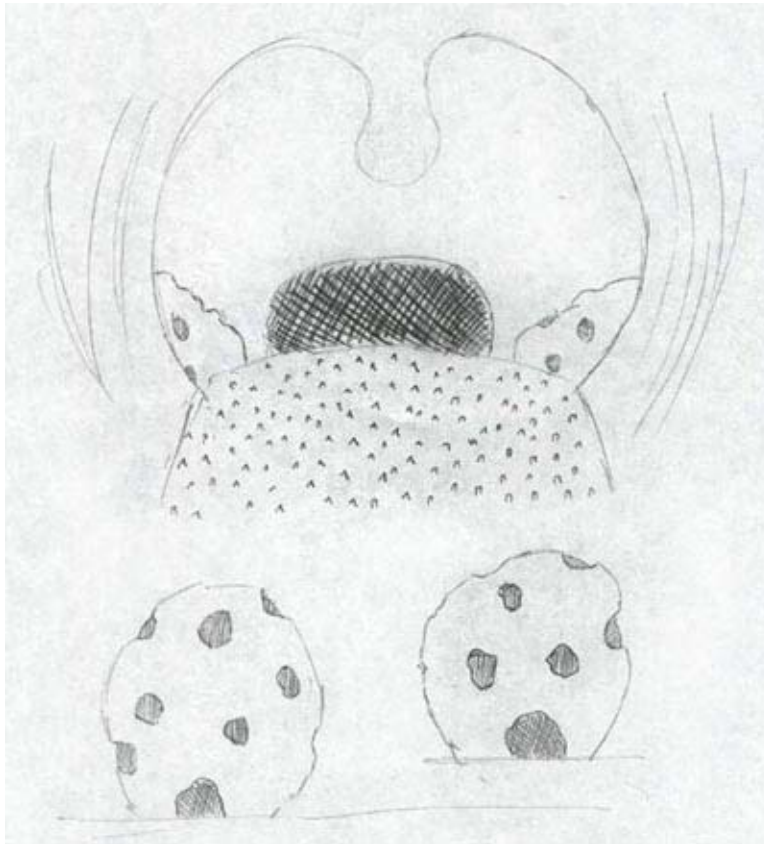
Description: The antibody must wade through the mucus to find the emergency lever all the while being pursued by the numerous Grunts contained in the mucus. The antibody can avoid the Grunts if it moves fast enough because the mucus prevents the Grunts from advancing very quickly. Once the valve has been released, the antibody must escape the mucus membrane before it breaks. It will be given 90 seconds to escape to the back of the nose before everything gets blown out.

*Mission 4: Stomachache **

Setting: Along the esophagus, proceeding down towards the stomach.

Objective: The Major Germs have setup a Yack Apparatus at the base of Jason's esophagus. This machine is shooting food back up to Jason's mouth causing him to vomit. The antibody must shoot down these flying pieces of food traveling up Jason's throat and eventually destroy the machine.

Description: The antibody will start halfway down the esophagus and must start shooting down the flying pieces of food. It doesn't need to shoot down every piece but the more it misses the more Jason gets sick. Once the antibody reaches the Yak Apparatus, it must eliminate the Majors before destroying the machine. After getting rid of the machine, the antibody will notice a medicinal capsule located behind it. It will not know what to do with it yet, but it'll pick it up for analysis by Central Command.



Concept Art of Tonsils and Mouth

Mission 5: Sore Throat

Setting: Jason's tonsils

Objective: The Grunts and Majors have commandeered the tonsils and are wreaking havoc with Jason's sore throat. The antibody must cleanse the tonsils of these infections.

Description: The antibody will start the mission somewhere in between the tonsils, he can begin at either one but he must clear out both of them to complete the objective. The Germinator will be introduced during this mission as the leader of the germs who've taken over the tonsils. There will be a Germinator in each tonsil that the antibody must deal with. Both tonsils will be heavily fortified and the antibody will face many enemies before completing this mission.

Mission 6: Rash and Sores

Setting: Just below Jason's epidermal layer along the length of his arm

Objective: The infection is trying to get worse and is attempting to create sores and rashes under Jason's skin. The antibody must stop this before it gets any worse.

Description: To eliminate this threat, the antibody will travel down one of Jason's arms in a self guided vehicle and destroy as many budding sores as possible. While it is doing this, Majors will be stationed along its route to try to deter it from the objective at hand.

*Mission 7: Sneezing **

Setting: Jason's nasal passages

Objective: Several groups of Majors and Grunts are causing Jason to sneeze uncontrollably. The antibody must stop this before it is too late.

Description: There is an urban legend that says if a person cannot stop sneezing they will die because their heart will stop beating. Jason cannot stop because of the germs and he only has 7 sneezes before his heart will stop pumping. Although his sneezing is blasting a few of the germs out of his nose, most are still there. The antibody must get to four groups of germs and destroy them before Jason sneezes 7 times. Central Command is helping out by redirecting the sneeze blasts out through Jason's mouth so that the antibody won't be blown out with the rest of the germs. But there is a problem and the blasts are returned through the nose. The antibody must complete the objective while trying to stay inside Jason's nose.

*Mission 8: The Remedy **

Setting: Jason's lungs, at the main infection site

Objective: The antibody has finally fought off all the symptoms of the J-Virus, it must now go and eradicate the J-Virus itself.

Description: It will be revealed that after analyzing the capsule found behind the Yack Apparatus actually contains the antibiotics needed to destroy the J-Virus. Central Command will update the antibody's weapon to harness these antibiotics and have a stronger attack. The antibody will start the mission near to the infection site, but it must fight its way in. Since the J-Virus is aware of its imminent demise, it has hurriedly produced minions to stop the antibody. There will be Grunts, Majors and Germinators to deal with before the antibody gets to fight the deadly virus. She will have two attacks: a

pathogen gun that inflicts heavy damage when hit, but the shot travels slowly; and a Grunt generator that creates several Grunts at a time to attack the antibody. Once the antibody has destroyed the J-Virus, Jason will return to a healthy teenager and the game will end.

VI. Scripts

Under construction

VII. Cut Scenes

Introduction to the game

The game opens with an introduction to Jason; he is walking through the store behind a coughing and sneezing man. The player (an antibody) is then shown inside Jason's mouth and is being given a briefing of his responsibilities for his first day on the job. A cut back to Jason shows him passing up the sick man. Another cut goes back to the antibody milling about, somewhat bored with his job. The player starts to see some Grunts coming down towards him and is told to defend from infection. This goes directly into the first level.

After the first level (which the player fails automatically)

The germs are shown taking over the mouth, and destroying all the other antibodies on duty. They are then seen spreading throughout the body cutting off Central Command from any action. The antibody is briefed on the status of the situation and is given his

objectives. While the antibody is being briefed, Jason is shown with a fever and the antibody then travels to the brain to fight the infection.

Each following level

Roughly, each mission will start will proceed about the same way. It will start with the antibody getting briefed on the current status of Jason, and what the next objective is.

While the antibody is being briefed, there will be a cut to Jason's progress, this will usually show the current symptom he's suffering from (i.e. sore throat, sneezing, vomiting). Then the antibody will travel to fight the symptom off.

The end of the game

After the virus is defeated by the player the virus will begin to dissolve and the antibody is victorious. Jason will be shown as a healthy, happy teenager again.

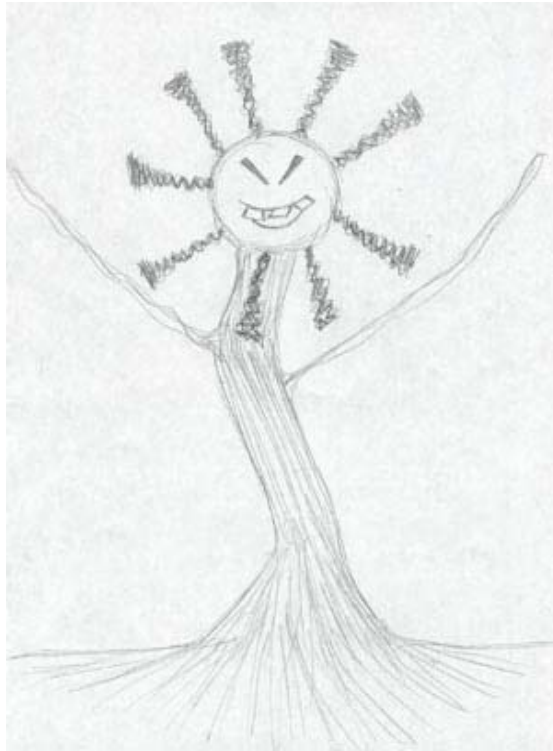
VIII. Artificial Intelligence

Enemy

The grunt germ will attack the player by moving towards them with the intent to kill.

The more advanced germ will have weapons that allow them to shoot the player. The final J-Virus will have special attacks on the player which include infection bombs and germ generating guns.

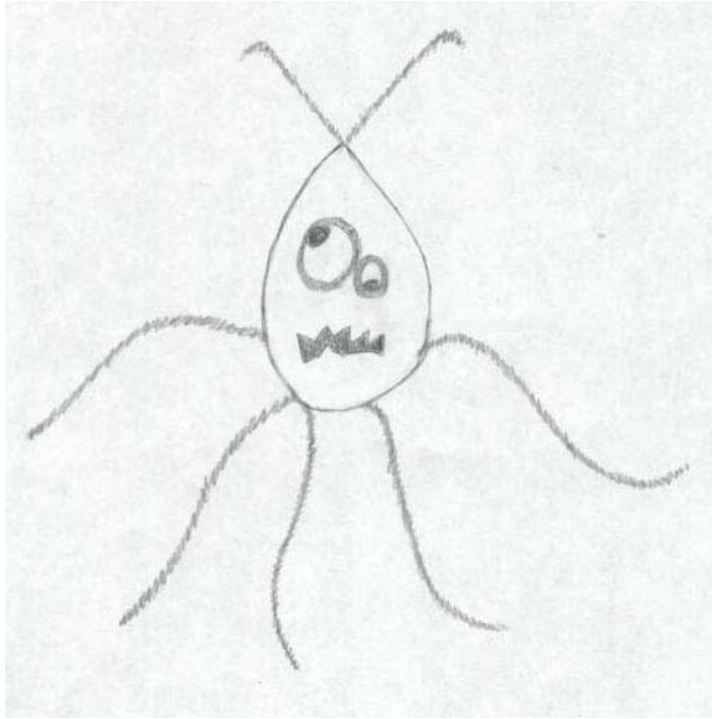
IX. Additional Concept Art



Concept Art of Brain Minion



Concept Art of Nasal Passages



Concept Art of Grunt

Technical Specifications

Programming Languages

The programming language that will be used is C++, with the engine using some ASM.

The compiler to be used will be the C++ Boreland compiler.

Code/Engines

We will be using a game engine called Boom 2, developed by Emil Dotchevski. Boom 2 is a 3D engine for creating real time “corridor shooter” games, and is based off the old Doom engine. It is capable of handling any kind of geometry, and maps with unlimited size. It is limited to map generation and player movement.

Target Hardware and Operating System

- Windows 95 or better
- 486 or better CPU
- 16 MB RAM
- Soundcard
- Video – minimum requirement: VESA card

Classes

class Tmap; contains all information for one level

void save(); saves map to current file

bool load(); loads the map from current file

void unload(); unloads map

void draw(); draws map from current point of view

bool move(); moves current point of view

bool collision(); checks for collision with map

class Tcluster; contains all information for one cluster of map

void save(); saves cluster to current file

bool load(); loads the cluster from current file

void unload(); unloads cluster

void draw(); draws current cluster

void sort_contours(); sorts contours in cluster

void reset_countours(); removes contours after drawing is complete

class Tsector; contains all information for one sector of cluster

void save(); saves sector to current file

bool load(); loads the sector from current file

void unload(); unloads sector

void draw(); draws current sector

int build_contours(); builds contours from lines in sector

void draw_floor(); fills polygons with floor texture

void draw_ceiling(); fills polygons with ceiling texture

bool inside(); check if inside sector

int collision(); check if intersects with sector

class Tline; contains all information for one line in sector

void save(); saves line to current file

bool load(); loads the line from current file

void unload(); unloads line
void draw(); draws current line
class Twall; basic class for walls in game
class Enemy; basic class for enemies in game
class Status; basic class for player status in game
class Thole; wall without texture that leads to another sector
class Tportal; wall without texture that leads to another cluster

Algorithms

Enemies will be located at fixed locations on the current level. They will lay dormant until triggered by an event initialized by the player or if the player gets within a specified range of the enemy. Once an enemy is in attack mode, it will remain so until destroyed or if the player manages to move past a certain range from the enemy. We will use a shortest path algorithm to determine how the enemy approaches the player. Once the player is within attacking range, the enemy will attack.

Version Control

We will use WinCVS 1.20 for version control in our project, which we downloaded at www.wincvs.org.

Schedule and Personnel

Under construction