COMP4501A Project Proposal

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Disclaimer: Some CRC cards may be split over page breaks.

Overview

The game shall be titled *affliction*. In the game, the player will control a host of organs and microorganisms within the human body with the objective of defending against a threatening virus. At the start of a game, a tumor will exist somewhere in the body unknown to the player (fog of war area). This tumor will begin the production of enemy units which will surge toward the player to destroy organs and spread tumors. Enemy units will consist of pathogens, which are infectious killing virus units which only serve to destroy allied units and organs, and spores, which are virus units with the intention of spreading and creating more tumors throughout the body. Tumors continuously expand and produce new virus units.

The player will have control over a heart, lungs, brain, stomach, and kidneys, each of which has its own special function and upgrades. All organs need to be constantly supplied with oxygen, otherwise they begin to continuously take damage over time. Organ upgrades need to be paid for with protein, a nutrient which will be discussed shortly. The heart will be responsible for the production of blood cells, taking erythropoietin as payment. The two types of blood cells which can be produced by the heart are red blood cells and white blood cells. Red blood cells will be able to collect nutrients and deliver them to organs (if applicable) while white blood cells will be able to attack viruses and tumors. The lungs will be responsible for producing oxygen to be retrieved by red blood cells. The brain will be capable of researching new upgrades for organs and blood cells, paid for with protein. The stomach will be the location to mine protein. And finally, the kidneys will be the location to mine erythropoietin.

The objective of the game is to destroy every last tumor and every last virus within the body. Since all organs controlled by the player can be considered of critical value, then should the player have half of the organs destroyed, it’s game over (that’s right, the game goes on if you just lose the heart, or just lose the brain).

Architecture

The following CRC cards describe the responsibilities in the relevant game classes.

Unit	
Responsibilities	Collaborators
-Knows health -On attacked event	

Microorganism	
Responsibilities	Collaborators
-Moves	-Unit

Blood Cell	
Responsibilities	Collaborators
-Is allied microorganism	-Microorganism

Red Blood Cell	
Responsibilities	Collaborators
-Harvests nutrients from organs -Carries nutrients	-Blood Cell -Organ -Nutrient

White Blood Cell	
Responsibilities	Collaborators
-Attacks viruses and tumors	-Blood Cell -Virus -Tumor

Organ	
Responsibilities	Collaborators
-Requires oxygen to be sustained, otherwise takes damage over time -Can receive protein to upgrade to enhance function -Can upgrade defense	-Unit -Oxygen -Protein

Heart	
Responsibilities	Collaborators
-Can receive erythropoietin to produces blood cells	-Organ -Erythropoietin -Blood Cell

Lung	
Responsibilities	Collaborators
-Produces oxygen -Passes oxygen to red blood cells	-Organ -Red Blood Cell -Oxygen

Brain	
Responsibilities	Collaborators
-Can research organ upgrades and blood cell buffs	-Organ

Stomach	
Responsibilities	Collaborators
-Produces protein -Passes protein to red blood cells	-Organ -Red Blood Cell

Kidney	
Responsibilities	Collaborators
-Produces erythropoietin -Passes erythropoietin to red blood cells	-Organ -Red Blood Cell -Erythropoietin

Virus	
Responsibilities	Collaborators

-Enemy microorganism	-Microorganism

Pathogen	
Responsibilities	Collaborators
-Attacks blood cells and organs	-Virus -Blood cell -Organ

Spore	
Responsibilities	Collaborators
-Builds tumors	-Virus

Tumor	
Responsibilities	Collaborators
-Grows over time -Produces new viruses	-Unit

Nutrient	
Responsibilities	Collaborators
-Can be held by red blood cells -Can be spent	

Oxygen	
Responsibilities	Collaborators
-Can be delivered to replenish organ oxygen level	-Nutrient

Protein	
Responsibilities	Collaborators
-Can be spent to purchase organ upgrades	-Nutrient

Erythropoietin	
Responsibilities	Collaborators
-Can be spent to purchase blood cells from heart	-Nutrient

Additional features

Should there be extra time for development, some additional features are as follows.

White blood cells

Having only one type of offensive unit can make a game dull, and is most certainly not realistic in this case where there are actually many types of white blood cells. Dividing the white blood cell offensive units in the game can allow for more strategic play. Here are some ideas for incorporating different types of white blood cells in this game as different unit classes:

- Neutrophil: cheap grunt/swarm units, close ranged attacks, has mid defense and health
- Eosinophil: area of effect, damage per second attacks, has high defense
- Basophil: expensive tank, largest, can attack close ranged, can cause inflammation to buff allies and nerf enemies, has high defense and health
- Lymphocyte: *Natural Killer Cells*, ranged specialty attacking units, low defence and health but high attack, special ability to gain experience for each kill and becomes more proficient against the types of units it has kill (this is an actual thing)
- Monocyte: healer support class, special one time ability to mutate into an expanding foam which deteriorates slowly and ends the lives of all in the vicinity as well as itself

These different units would all have a different cost to produce by the heart and the heart would need to be upgraded in order to produce some of them.

Organs

Additional organs such as the liver, spleen and appendix will be added to richen the gameplay possibilities. With functions for filtering blood and toxins, regeneration, and the appendix as a ticking time bomb, we think these organs would add a new level of depth to the game.

Pathogens

Having diverse ally units can only be balanced by having equally diverse opposing units. It time permits, it would be nice to also add an assortment of different pathogen units with different abilities. The more rare ones would only be able to be produced by tumors which have grown to a certain size.