Team 4: Ioana Pandele, Carlota Soler, Daniel Borges, Irene Baeza

Rot it!

Have you ever seen perfectly shaped food not ever going bad ? Have you ever wished that you could do something about it ? Now is your chance! Pick your bacteria type and decay that food! But be careful, other bacteria will try to sabotage you. Battle for the right to decay the food in your own way!

1. Game Description

Goal

The goal for which the players strive in this game is to destroy as much of the food piece as possible. The player who manages to destroy the biggest surface wins.

Game setup

Map

The battle takes place at a microscopic level, inside a piece of food. The surface is represented by a 2.5D map with top-down view, containing obstacles and resources. All the players can see the entire map, including their opponents.

The resources, as well as the players are spawned randomly on the map in the beginning of the game. As the resources are collected by players, they can respawn after a certain amount of time in other random locations on the map.

In Figure 1.1 there is a rough draft of how our game would look like. This was just a first idea, where the battle is taking place in a blueberry (blue floor map) and any bacteria has exploded yet (not other colors can be seen in the map). In the picture, there is a bacteria sprinting into another to kill it and take part of its strength.

Figure 1.1 - First map draft

Player stats and abilities

Every player has two characteristics: strength and energy.

The first will be shown as a number that grows as the player gathers resources. The strength of the players determines how big is the area that they can destroy.

The energy is denoted by a bar that has a maximum capacity and can be charged when a player stands still and keeps a button pressed. The amount of energy charged determines the speed and thus, the distance for which a player can sprint. The energy bar can be charged faster by stronger players.
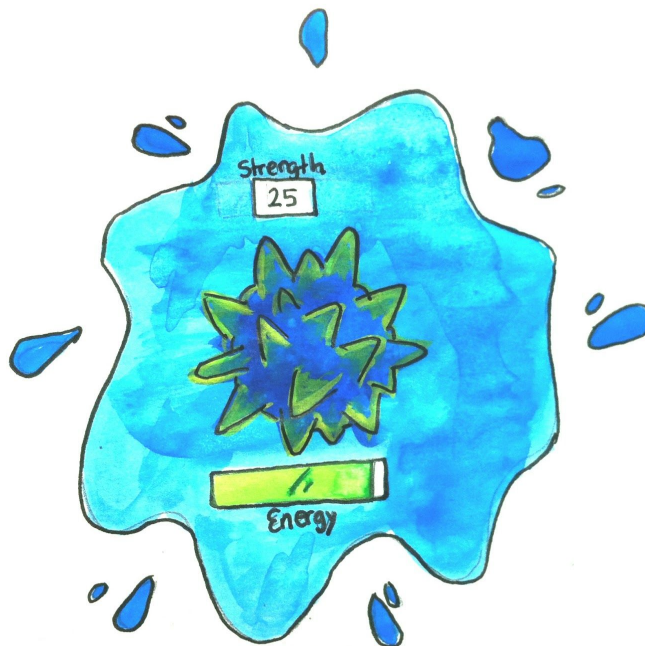

Figure 1.2 - Example of a player character

There are two main abilities that the players can make use of in order to win the match:

I.   Exploding themselves

When a bacterium explodes, it destroys (paints) a circular area around itself. The radius of this area is determined by the strength of the player. The bigger the number/value of resources gathered, the bigger the strength of that player and the bigger the radius of the explosion area. The player will be able to preview the area by pressing a button. This is necessary because mentally correlating the strength value with the explosion area is hard and not practical. The explosion

doesn't occur instantly at a press of a button, but takes a certain amount of time to charge.
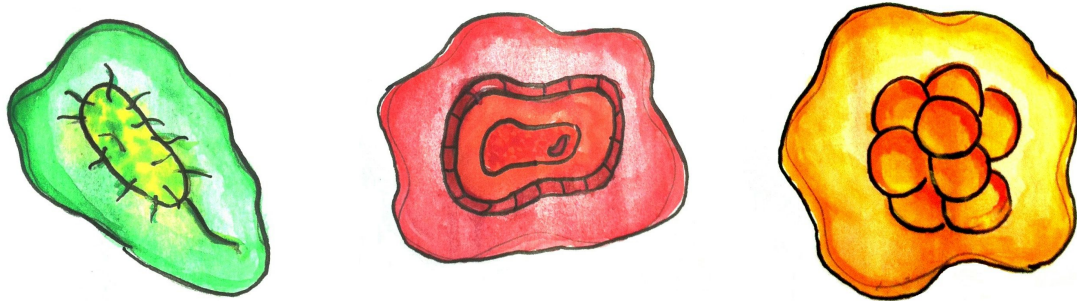

Figure 1.3 - Three different examples of bacteria explosions

II.   Dashing at other players

This is the way in which players can attack each other. The amount of energy that one player has determines the speed at which the player can sprint and thus, the distance covered by their sprinting. The time of a sprint is constant for all players. Dashing at other players can only be done in a straight line. The sprint stops, either when the time is up, or when a collision occurs. If one player hits another by dashing, then the other player dies and the attacking player gets a percentage of the other's resources.

Gameplay

The game starts with the players spawning at random positions on the map. At the beginning, every player has 0 strength and thus cannot explode. The players can move around, all with the same speed (except for sprinting).

Resource gathering

Resources also spawn randomly on the map, both in the beginning of the game and during the match. In order to gather resources, all the players have to do is run over them. Every resource add a certain strength value to the player that collects it. The value of the resources that have not been collected increases over time. Once a player collects a resource, it disappears, another resource spawning at a random point on the map after a certain time interval.

Explosions

When exploding, a bacterium destroys a certain area of the food surface. This will be visualized as a patch of the player's color on the surface of the map. The total percentage of the destroyed surface is shown for every player throughout the game. If an explosion

area of a player overlaps with an area that has already been destroyed, then only the newly destroyed surface counts towards the percentage. At every moment in time,

a player can check to see how big their exploding area is. In order to do this, they can press and hold a button. The area remains visible only as long as the button is pressed. If the player decides that they will cover an area that serves their purpose, they can decide to explode. In order to do this, they will have to stand still for a short amount of time while "charging" their explosion. Once a player explodes, they
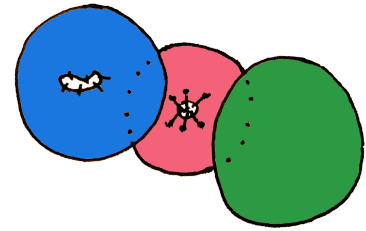

Figure 1.4 - Explosion areas

respawn with 0 strength at a random point on the map. This can occur either instantly, or after a certain amount of time, depending on how the game will be balanced.
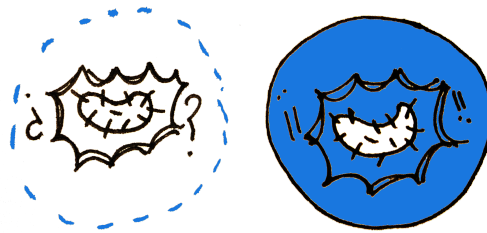

Figure 1.5 - Example of explosion check (left) and execution (right)

Attack and counter-attack

In order to sabotage other players, but also to grow their own strength value, bacteria can attack. The way to do this, is by dashing at other bacteria in a straight line. When a player wants to dash, they have to stand still while charging their energy bar (done by holding a button pressed). The stronger the player is, the faster the bar charges. As dashing takes a constant amount of time for all players, the energy bar determines the speed at which they sprint. The sprinting stops after the designated time, or if a collision happens. If the target was touched, the targeted player dies, respawning again with 0 strength, just like in the case of the explosion. The attacker gets a percentage of the strength value of the victim. If a player wants to defend himself, he can either put himself out of the attacking player's trajectory or he can counter-attack: run on the opposite direction. The stronger player will always win.
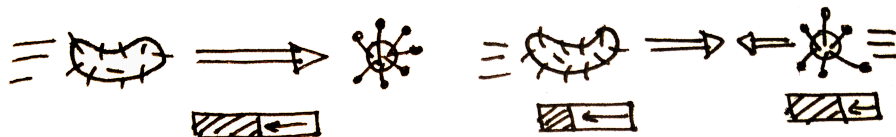

Figure 1.6 - Example of attack (left) versus counter-attack (right).
Note that bar consumption is proportional to displacement distance.

Game end

The match ends when no other player has the possibility to destroy a larger surface than the best player.

Targeted platform

This will be a PC game that can be played with controllers.

2. Technical Achievement

Rot it! Is mainly based on player interactions as well as fast movement and reactions. In order to make this run smoothly, we will implement a fast collision detection system. Apart from just restricting players' movements when they hit something we are aiming at implementing elastic collisions as well as collisions between players resulting in Z-axis rotations. This will make the game more challenging and interesting.

Another main element of this game are explosions and making them look plausible and pleasant is crucial. To achieve this we aim at combining pre-made animations with physical simulation to show both the explosion itself and the impact i has on the environment. We will also simulate blasts affecting the players' movement and possibly projecting them away from their original position.
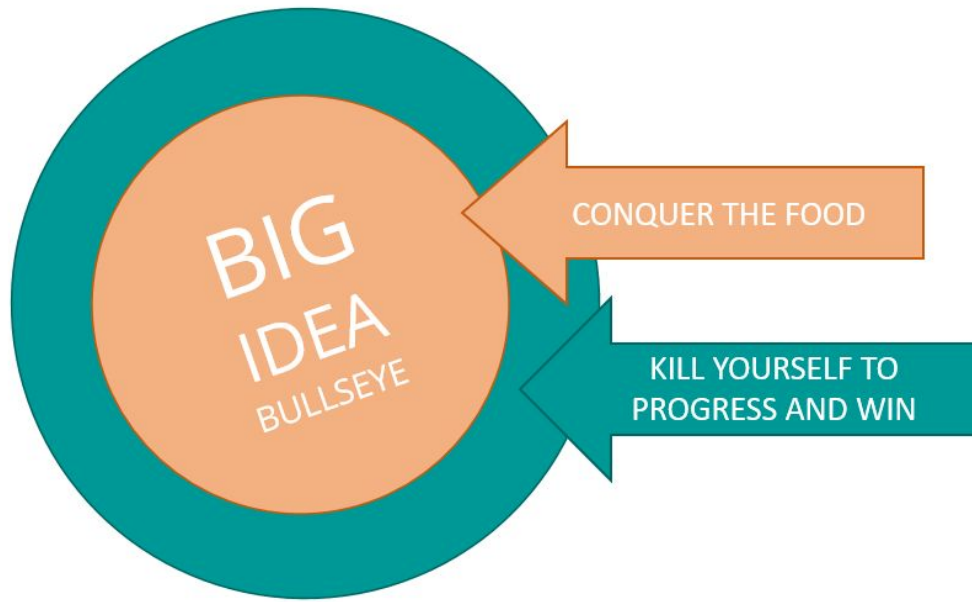
3. "Big idea" Bullseye

Big idea

Conquer the food.

Technical innovation

Kill yourself to progress and win.

4. Development Schedule

Layered task breakdown

Functional minimum

- 3D map (2.5D view) with scattered resources and boundary walls (simple objects)
- 4 players running around and gathering resources
- Basic explosions to conquer the food (area painting)
- Basic character mechanics and collisions
- Basic resources

Low target

- Advanced map (walls inside)
- Players interactions:
  - A player explosion can also kill other players
  - If a player gets killed, they will respawn randomly in other place, with zero strength again
  - If a player explodes, it will respawn randomly and continue playing (if he didn't already win with last explosion)
- Advanced character mechanics and collisions
- Add preview of explosion area
- Basic explosion simulation

Desirable target

- Explosion integration and interaction with environment
- Addition of dashing skill
  - When killing other players they gain proportional strength)
  - Addition of energy bar and energy bar charging (used for dashing)
- Advanced resources (value grow over time)
- Customize explosions appearance according to bacteria and food theme
- Add sound

High target

- Start menu to choose a character for each player
- Addition of special resources and obstacles
- Artificial Intelligent players
- Graphics improvement

Extras

- Add different maps to the game (different maps in the game are different foods to conquer)
- Online players competing in the same map

Task allocation

Task name	Time (hrs)	w1	w2	w3	w4	w5	w6	w7	w8	w9	w10	w11	w12	w13	w14
							Easter	1st play demo					Alpha release		
Assignments															
Game Proposal Draft	4		All												
Game Proposal Chapter	6			All											
Prototype Chapter	6				All										
Interim Report	10									All					
Alpha Release Chapter	10											All			
Playtest Chapter	6												All		
Conclusion Chapter	6														All
Deliverables															
Physical Prototype	16				All										
Alpha Release	16											All			
Trailer	16													All	
Miscellaneous															
Game Idea Presentation	2		All												
Final Game Idea/Prototype Presentation	2					All									
Monogame Setup	6				All										
Bug Fixing	16											All			
Playtesting	20											All			
Playtesting Presentation	6												All		
Public Presentation	8													All	
Functional Minimum															
Basic Modelling + Integration	8					Daniel									
User Controls Integration w/ movement	12					Irene									
Basic Explosion	8					Carlota									
Player score management	8						Carlota								
Collision Detection	16						Ioana								
Basic resource placement	8						Irene								
Low Target															
Player interactions	20							Carlota + Irene							
Handling Collisions with env	20							Ioana							
Modelling upgrade	16							Irene							
Explosion animation	20							Daniel							
Desirable Target															
Explosion integration	8									Irene					
Explosion interaction (physics)	20									Carlota + Irene					
Advanced skills (dashing)	20										Ioana				
Advanced resources	8									Carlota					
Improve explosion layout	10									Ioana					
Sounds	16									Daniel					
High Target															
Start Menu	16											Irene			
Special obstacles and resources	16											Carlota			
AI	12											Ioana			
Graphics improvement	8											Daniel			

5. Assessment

The game will be fast-paced and consist of short rounds. The game will have easy-to-learn controls that allow new players to get started very fast. Thanks to the different possible approaches (explode early, attack players to get resources, try to explode at highest possible strength, etc.), a lot of strategies are offered to the player to win the round. The aim is to produce a competitive and fun atmosphere.