Michael Petitclerc
January 31st, 2017
Rilla Khaled
CART 353

# Sonar Defense

## Project Overview

Sonar Defense is a tower defense game that strips "sight" from the player, creating a focus on sound to prepare appropriate defenses.

the game takes place on a map with several passages that flow to the center where lies the player's base. Vision is obstructed by a fog of war and only the players towers will clear the fog to create minimal vision. Enemies will flow from multiple spawn points and travel through the previously mentioned passages towards the player's base. The player must create towers that counter specific enemies in correct locations or risk defeat.

Players will discover the location of incoming enemies by using the mouse to create a sonar effect, and their type by receiving sounds
specific to the enemy by having the mouse near enough to their location.

Aesthetically speaking, the game will feature sprite art with drawn on 3d perspective. The color palette will be bright unless fog is present. and a User Interface will covey all player options and information including a minimap.

## Resources & Inspirations

Resources include…

- Sprites

Basic import and control over sprites on the pixel level.

- G4P

Help integrate interaction elements to the UI display.

- Path Finder Library

Easily implement paths that the enemies will follow as well as randomising which ones they take.

- Minim

Library that will allow me to import and use sounds.

Inspirations include...

Warcraft 3 Tower Defense

- Wintermaul
- Element TD
- Gem Td

The tower Defense genre boomed in the form of custom maps created by the playerbase of Warcraft 3. Here lies the foundation of what Makes the original top down view tower defense good.

Orcs Must Die

Orcs must die added a playable character to the tower defense genre inside a 3d environment. The game was about adaptability and base reconstruction on a moments notice, which is what I aim to accomplish in Sonar Defense.

Perception

An upcoming horror survival game where the player takes control of a blind girl in a strange house. Her vision is based off of sound created by her and the environment. My adaptation of this mechanic would be a very abstract form, but inspired nonetheless, of what Perception achieves.

Zelda: A Link to the Past

This is the art direction I would like to explore. The colors are beautiful and the art achievable within the scope of time needed.

## Project Scope

Tower Defense games are simple at their core, but require diligent balancing. For the sake of a technically stable game, balance will not be a focus beyond the concept of matching towers to enemy weaknesses, and to be able to provide a fun experience. I have grand vision for this project, but time is a constraint. With that in mind, I will present an achievable list of mechanics and game design to complete before the due date.

- Code the 3 c's [Character, Camera, Controls]
- Design a comprehensive UI that details tower options, currency, what is selected along with information associated to selection (Tower damage, attack type, vision range, etc…), as well as a minimap detailing information of the entirety of the game map in a small area.
- Design and implement several enemy types as well as tower counterparts.
- Create a fog of war that fades according to tower location.
- Create a sonar effect that locates enemies and then adding the sound acquisition mechanic that tips off the enemy type to the player.

- Create a makeshift AI that randomizes where enemies spawn and which path they travel towards the center point destination.

All this together would present a working game that gets the point across. When achieved, and if time allows, I would like to create more depth to the game by…

- Creating tiers of difficulty. This would include different map options, enemies with higher stats, different enemies, etc…
- Design polished visuals and optimize the comprehension of the game without too much hand holding.
- Allows the option of connection via LAN to allow multiple players to join into a single play session.

## Rough Workout

Controls [including keyboard and mouse input] is pretty straight forward as well as implemented the art assets to the final game including the UI. I will be using the pathfinding library pack to create the "AI" previously discussed as well as the sprite library to facilitate implementation and modification of art assets in processing.

The true challenge lies in the use of the sonar and sound acquisition mechanics. For sonar, I will be using pixels created by the mechanics visuals and enemies and create collision based off of these two variables. When detected, a smaller sonar visual will appear noting the location on the map & minimap. Enemy sound acquisition will be based off of mouse proximity ingame and the location of enemies. All incoming information will be based off of distance between the position of mouse and enemy allowing sounds to be lower or louder based off of said distance.

For the fog of war, I will create a layer on top of the entirety of the map (excluding UI), and will play with its opacity based off of the location of the players towers range of sight. This will be achieved by accessing the pixels of the layer.

The final challenge will be the interaction between the tower class and enemy class. Making sure that information is shared safely between the classes and their instances is important structurally. This is an area I am having small troubles on, but will use the resources provided in the readings to make sure all runs smoothly.

The rest of the process will be pretty simple. I just need to put everything together under the same roof in a working game.