

# Game Design Document

## The Lookout

By: Yong Liang

The main idea of the game is a hero runs around a map to secure as many Lookout towers as possible, while surviving oncoming waves of enemy. In this game, the player have to “acquire & maintain & hold” the towers through upgrades and strategic acquisition. The player wins when occupied a fixed number of towers in the map for a period of time without losing them to oncoming enemies.

### ○ Controls

- One hero moves around on the map using mouse click.
- Shows a target/circle of the mouse on screen
- Upgradeable buttons for towers, and hero
- A panel at the side to display info and show these upgrade buttons

### ○ Menus:

- States in the game class with Start, Pause, Restart, Endscore

### ○ Modes

- Acquire mode – default start of the game
- Survival mode – increasing enemies spawn until countdown over and wins the game

### ○ Objective display

- Shows how many towers remaining to win the game
- Once all tower acquired, countdown timer starts.
- Survival mode starts until countdown is over.

### ○ Economy

- The game requires resources of “gold” to upgrade hero and the tower for better health and weapon damage.
- The gold variable will display on the top and use a timer to update every second

### ○ Game entities:

- Hero
  - Might be a character or a vehicle
  - Player will interact with mouse click and upgrades.
  - It automatically attacks enemies in range with bullets or lasers after upgrades. Or attacks the one that is being selected by mouse click.
  - It will have upgradable health bar and weapon.
  - If the hero dies, timer will start and after it ends, the hero reborns with full health
- Enemy types/bosses
  - Entity pool, around 5 different enemy classes, different walking speed.
  - Regular enemies will be stationary and spawn randomly on the screen. They only attack when there is hero or tower nearby.
  - Special spawning enemies will appear whenever the hero acquires a tower. The hero has a few seconds to prepare to defend the tower.
  - Each enemy type will have predefined health bar and damage % ratio to the hero's powers. Maybe once a while special boss spawn will have higher ratio to hero

- Towers
  - Stationary object with few frames of normal vs damaged
  - Default as neutral towers, hero have to attack it to obtain the tower. Once acquired, special spawning enemies will come attack the tower. Also the health bar will change color from gray to red.
  - Towers can be upgraded to have stronger health and auto defending weapons.
  - Every tower help boost the gold gain per second.
  - Connected/nearby tower might get extra bonuses in attack.
  - If a tower is destroyed by enemies, tower keeps its upgrades but turns into gray. Hero will have to gain it back by attacking it.
- AI
  - Regular enemies will approach the hero when it's within a defined radius range. Also for special spawning enemies will go directly towards the towers that is acquired. This approach action will need to use A\* heuristic search for the best path to avoid obstacles. Possibility highlights the path towards the tower on the map as well.
- Power ups (how do they work?)
  - Random treasure chest will spawn on the map, and the hero will have to run to get them. The chest will give gold, or a free upgrade to the hero's ability
- Levels (how many? designs?)
  - For now there will be one map for the game. Using google map and weltmeister for collision
  - In the future, the maps can be auto generated and have unlimited levels.
- High scores
  - Score variable display at the top
  - Score is calculated by the enemies killed, and gold acquired. Then it is decreased by the total time used to complete the game
- Art, sound, and other effects
  - Background image/banner for start and end of the game
  - Bullets or lasers frames
  - Towers frames
  - Heros frames
  - Enemies frames
  - Mouse display frames as target/circle
  - Plan to use peaceful farmland Scotland type of background music.
  - Sound for upgrade maybe stash of coin sound.
  - Sound for tower under attacking, age of empire similar
  - Sound for opening bonus chest
  - Sound for winning the game, Scotland/Braveheart type of sound
  - Weather effects like snow, rain, falling leaves, white fog on screen.