PROJECT CYBER B

May 5th, 2018

Team:
Hannah Chase, Anna Karwacki, Karl Jiang,
Robin Mosher, Noah Parker, Raymond Stempel

Overview

When the player puts on the headset they take over their cyber-persona: The User. The User wants to go into high ranking and secure systems and grab the most important part of the system: the soul.exe and get out. But this isn't a simple task, once you are in you need to be strategic about what you are doing because the system want you out. However you are not alone in your task, you are able execute programs that will help defend you and help you reach the exit.

This turn-based, team strategy game put the player in the action as they are moving through the system, moving their motion controllers to summon a program minion or attack the enemy directly. Can you get in and get out without dying?

Team Roles

- Hannah Chase
    - 2D/ 3D designer
    - Modeler
- Anna Karwacki
    - Project Lead
    - Design Doc updater
    - VR in Unity Guru
- Karl Jiang
    - 2D/ 3D designer
    - Modeler
- Robin Mosher
    - 2D/ 3D designer
    - Modeler
- Noah Parker
    - AI programmer
    - Terrain Generator
- Raymond Stempel
    - Gameplay Programmer
    - Code architecture
    - Tech support

Gameplay/ Mechanics

- Game Loop
    - ~10 mins per game

  - Players Turn
    - Any user actions within action cost
    - To perform a user action, each one has a cost, movement is free but limited
  - Enemy Turn
    - Spawning
    - Movement
    - Action
- User
  - Health: 5
  - Action point pool, 5pts per turn
  - Actions
    - How to activate: hold down button and make shape
    - Move around, 2 tiles (2m)
      - Extra Move 1 tile, 1pt
        - Once per turn
    - Summon minions
      - Small boy - 2pts
      - Big boy - 3pts
      - Range: 2 tiles
    - Attack enemies
      - Fireball - 3pts
        - Damage: 2
        - Range: 3
      - Punch - 0pts
        - Damage: 1
        - Once per turn
    - Pick up objective
      - Pickup/drop/pass - 1pt
      - Cannot summon while holding objective
    - Give commands, control minions
      - Attack
      - Move
    - Look at overview map
- Objective
  - Collect information object
  - Deliver to location
- Minions
  - Little boy: faster but weaker
    - Health: 2
    - Movement: 3 tiles
    - Attack: 1
  - Big boy: slower but stronger

    - Health: 3
    - Movement: 2
    - Attack: 3
  - While holding objective, -1 movement, can’t attack
- Enemies
  - Try to kill user
  - Defend objective
  - Return objective to original point
  - Types:
    - Little Boy: faster but weaker
      - Cost: 2
      - Health: 2
      - Movement: 3 tiles
      - Attack: 1
    - Big Boy: slower but stronger
      - Cost: 3
      - Health: 3
      - Movement: 2
      - Attack: 3
- Map
  - Hex grid using Cube Coordinates
    - (x, y, z) , x + y + z = 0
    - (0, 0, 0) is center of the map
    - Hex tile width: 1m
    - Hex direction: pointy end up
    - Map size: 13x15 , 15x17
    - https://www.redblobgames.com/grids/hexagons/
    - https://www.redblobgames.com/pathfinding/a-star/introduction.html
  - Objective in center-ish, most likely at (0,0,0) or the surrounding tiles
  - Exit is opposite-ish side of the map
  - Player enter zone
  - Enemy spawn zones
    - ~3 zones per map
    - Zone is made up of 1 tile and the 6 around it
    - Have them next to walls and edges

Technologies being Used

- Unity version 2017.3.1p3
  - https://developer.microsoft.com/en-us/windows/mixed-reality/unity_development_overview
  - https://unity3d.com/learn/tutorials/topics/virtual-reality/interaction-vr

    - https://unity3d.com/learn/tutorials/topics/virtual-reality/movement-vr
- Maya, Blender, Substance
- HP Mixed Reality headset
    - https://ritchielozada.com/2017/08/02/getting-started-with-immersive-mixed-reality-headset-part-3-development/
- Windows 10

AI

Enemy Controller

- Enemy Spawning
    - Has 10 “points” that are used to summon, enemy minion takes up cost will alive
        - Big Boy: 3 pts
        - Small Boy: 2 pts
- Enemy AI Notes
    - Goal
        - At beginning of game, defend objective
        - When User get close, attack user/minions
    - Spawning
        - During spawning, spawns small then big boys
        - Only spawns big when other enemy minions die
        - Before objective is taken, spawn max of 2
        - Once objective is taken, spawn max of 3
    - Movement
        - Move big first, then small
        - Big attack first, then small
        - Use small boys as swarm
        - Use big boys to defend positions or attack holder
    - Attacking
        - Always attack if can
        - Attack holder of objective
    - Once objective in held by enemy, target user
- Logic
    - Finite State machine
    - Goal Oriented Action Planning
    - https://gamedevelopment.tutsplus.com/tutorials/goal-oriented-action-planning-for-a-smarter-ai--cms-20793

Enemy Units

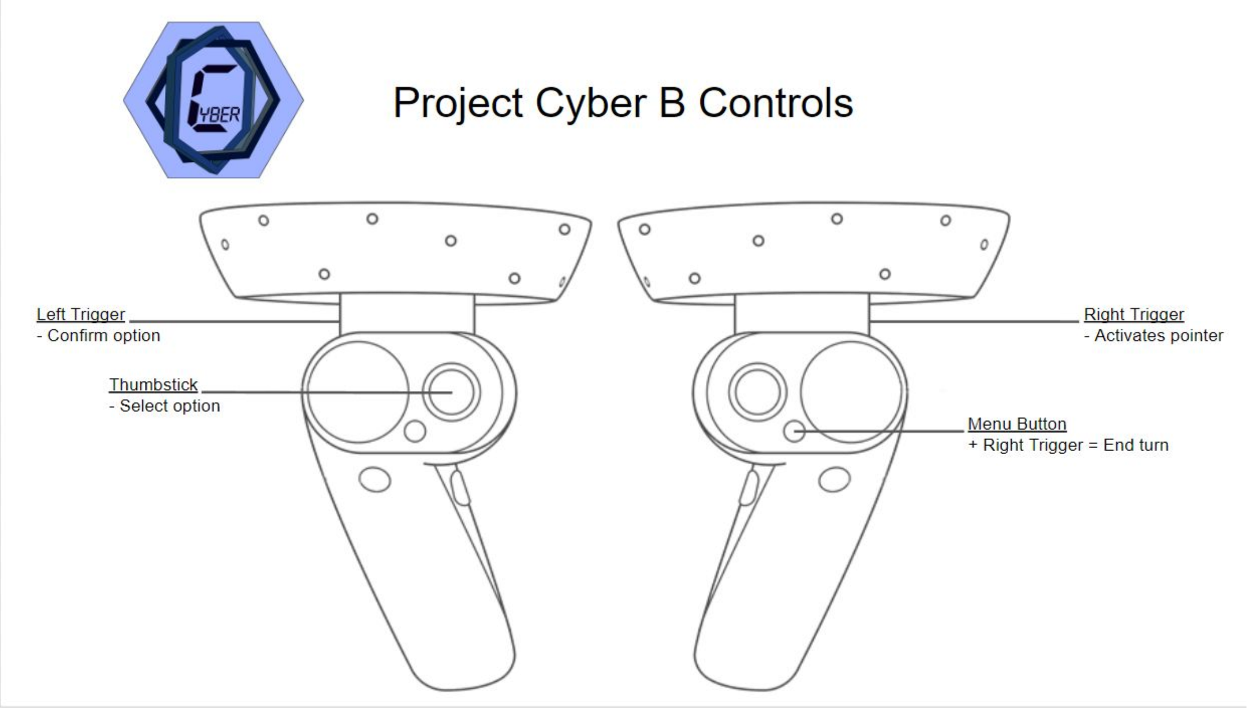
- States that determine action
- Move then attack
- Attack (unit): move toward unit and attack it if possible

- Defend (tile): aka move to tile and stay on tile

Motion Controllers

What will the controllers be used for:

- Right Controller
  - Point and click the right trigger to move
  - Pressing the Menu button and the right trigger will end the turn
  - UI info on Mana and Health
  - UI info on if its Player’s turn or Enemy Turn
- Left Controller
  - Will show the menu with what the player can do with what they are interacting with
  - Using the left thumbstick to select the option they player wants to do, left trigger will select the option.



Art Style/Concept Art

Link to Google Photos album that has the Reference Images and some Concept art for a couple of possible program cards:

https://photos.app.goo.gl/Upjv7Xo9PpV8soUm2

Major influence for the design of the environment of the game is movies such as Tron and Tron Legacy.

UI

- Integrated UI, world space UI, diegetic interface
- On the back on the right hand will show the Health and Mana of the player, the image background for this UI will change colors to show who's turn it is. Blue is player's turn, red is enemy turn.
- On the left hand the UI will only appear when the player interacts with something to show the options of what the player can do.
- https://medium.com/inbeta/dead-space-ui-design-lessons-for-vr-39aa9e976ca8

Models

The UI will comprise of a 3D model of a tablet that the player can interact with to be able to see all the things that they are able to do.

Both sides: the user and the enemy will have 2 models of program minions that will be used in combat. Each side will have a small and large minion. Ideally it would be nice to have each side have their own unique design for their minions, but will aim to have just two models for minions, textured to be noticeably different for what side they are on.

Program Animations:

- Idle
- Activation (When it comes into the world)
- Attack (simple jump forward, refer to old pokemon games for reference)

Class Structure

- GameManager - control the game and have turn order, map, and other things in it
- MenuManager - keeps track of scenes, main menu, pause menu, etc.
- Map - holds hexs that create the level
- Hex - a tile, has location and type
- Agent - base class that keeps track of health, movement, location
    - User - the Player with mana, abilities, interactions with all VR stuff
    - Minion - ally and enemy minions that can move around
- EnemyController - controls all enemy minions and has AI code
- MotionController
- RayCasting

Paper Prototype

- Two player
    - User
    - Enemy Controllerz
        - Followers strict rules that reflect what the AI would do
- Map
    - Hex paper with obstacles and markings
- Player Actions
    - Represented with a reference sheet

Digital Prototype

- User
    - Movement
    - Summon minions
    - Hand movement not required
    - Pick up objective
- Minions
    - Move
    - Attack
- Enemies
    - Summon
    - Movement towards player
    - Attack
- Map
    - Hex map
    - Graybox environment
- Models
    - Blocked out versions of the two programs
        - Different textures for different sides

Minimum Viable Product

- Goal
    - User takes objective to exit
- User
    - Movement of user character
    - Abilities with costs
        - Summon minions

      - One bigger, one smaller
    - Move minions
    - Attack of some sort
  - Pick up objective
  - Health
- Minions
  - Health
  - Damage
  - Move
  - Attack
- Enemies
  - Summon
    - When the number of enemies on the field drop to be below an amount, more enemies will be brought in during their turn.
  - Movement
  - Attack
  - AI
    - Attack User
    - Defend Objective
    - Retrieve Objective
- Map
  - Hex map
  - Terrain obstacles to give the area more depth
- 3D models
  - Environment
    - (need to list out what would be wanted)
  - Player Programs (2 different models)
  - Enemy Programs (2 different models, could just be retextured player program models)
- Animations for programs
  - Idle
  - Action
  - move