CSEE 4840 Project Proposal
A Tower Defense Game: SAVE CROPS

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Description

In this project, we will be implementing a classic strategy video game, tower defense. Where the goal is to stop the enemies (pests) from reaching a specific point (farm gate) on the map by building various of defense towers (basically we will create four different kinds of tower) which shoot them as they pass. Enemies will have different abilities, for example motion speed, health points level, etc. Defense towers would have various feature, such as shooting frequency, damage per second and shooting range with distinct cost and upgrade price. When an enemy is defeated, the players gains points which can be used in purchasing or upgrading weapons. The level of hardness is designed to increase linearly as proceed. Eventually, the game is over when the player let fifteen enemies survived and reaches the farm gate.

Implementation

The Sockit board is going be used as the main compiler and running platform. A PlayStation controller is implemented for game control. VGA graphic display on a screen to show 2D graphics and motion. The sound effect is going to be achieved via a audio controller.

- ❏ Input: Command is received from PlayStation controller button input, including directions "up", "down", "left", "right", "confirm", "back", and "exit".

- ❏ Output: The screen displays via VGA port, and the sound effect play with different scene.

Algorithm

- Enemies' movement and their turning direction based on map route plan

- Defense towers' attacking range, changing attacking trajectory, and frequency depends on different level

- Enemies' changes after receive attack, and the condition for disappearing on the map

- Different game modes such as beginner, professional, and master

- Different defense building has their own distinct action and properties

- Simple algorithms for system randomly selecting several different attack characterizes depends on player's level.

- System will randomly rewards players items based on their playing progress

- System will self-determine victory and defeat conditions

Hardware

- Setting up peripheral as controller, such as PlayStation controller.

- Setting up VGA graphic display on monitor

- Setting up sound driver and using speaker as sound device

- Building SRAM to load/store game data (optional)

Software

- Game background and scene design

- Attack characters' and defense characters' configurations and appearance design

- Attack characters' moving path design

- Peripheral controller interface design and setting up

- Simple game sounds and scene background music design

- Game details setting up, such as victory and failure conditions