TwoTD

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Project Description

Our project, 2TD, is a two-player tower defense game. There's a lot of traditional tower defense games out there, but not a lot that take the point of view of the evil mastermind who controls the invading monsters.

The first player in the game has the traditional role of a tower defense game - they select a tower and click a position on the map to place it. When they're done placing towers, invading monsters attempt to cross the map. The player looses a life every time a monster successfully crosses the map, and wins if he or she survives the round.

The second player gets to control the monsters. He or she can choose from a variety of monsters with unique abilities. Each of the monsters produces a different amount of damage. The player's goal is to send enough monsters across the map to kill the second player.

We had to decide how to split up the controls. The player in charge of the towers gets to use the mouse, and the player in charge of the monsters uses keys to select monsters. They'll then see a description and choose whether or not to create the monster, or whether or not to activate the monster's ability. We felt that the shared controls offer an additional element to the game for extra competitive players.

There are three types of monsters: slime, ghosts, and robots; and they all have unique capabilities. Slime monsters have the ability to heal themselves. Ghosts have increased speed, and robots have the ability to increase their armor for 15 seconds. There are also three types of towers: the Statue of Liberty, the Eiffel Tower, and the Pyramid.

Vision

Introduction
This Tower Defense will allow two players to play, one as the classic defensive tower builder, and the other as the "bad guy," in control of what monsters are being sent and when their abilities are activated.

Problem Statement
There are plenty of Tower Defense games out there from the perspective of the valiant defenders, but what about the evil masterminds who send the evil monsters to their deaths?

Key high-level goals
A two-person tower defense game that allows one player to create defense towers and the other to control invading monsters.

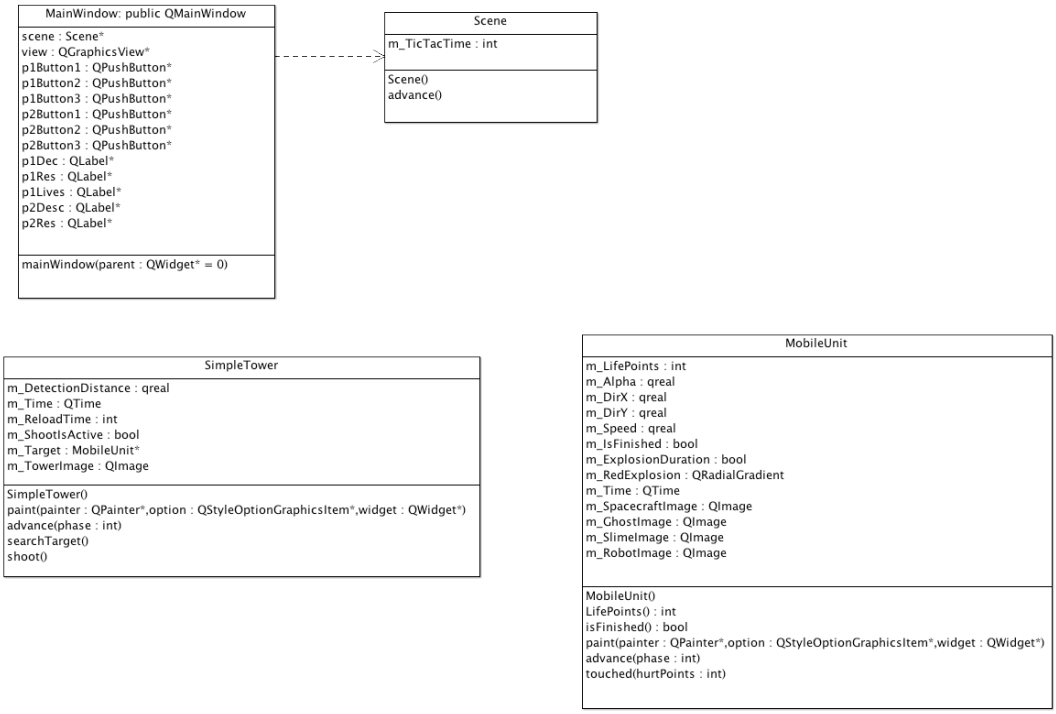
High-Level Goal	Priority	Problems and Concerns	Current solutions
A tower defense game that is enjoyable for two players	High	Difficulty in creating same level of difficulty for both players Difficulty of choosing a timer setting that doesn't feel too fast or too slow Typically easier to defend than to successfully send monsters Concern about which abilities will feel "fun" and whether any of them will feel "unfair"	Existing tower defense games do not have one player control monster and other control towers
Easy-to-use interface	High	Giving one player options takes away options from other player	Current two person games give one person use of the keyboard and the other use of the mouse

User-level goals
The users need a system to fulfill these goals:
Player 1: Builds towers, attempts to survive duration of level
Player 2: Create monsters, toggle through monsters, attempts to kill player 1

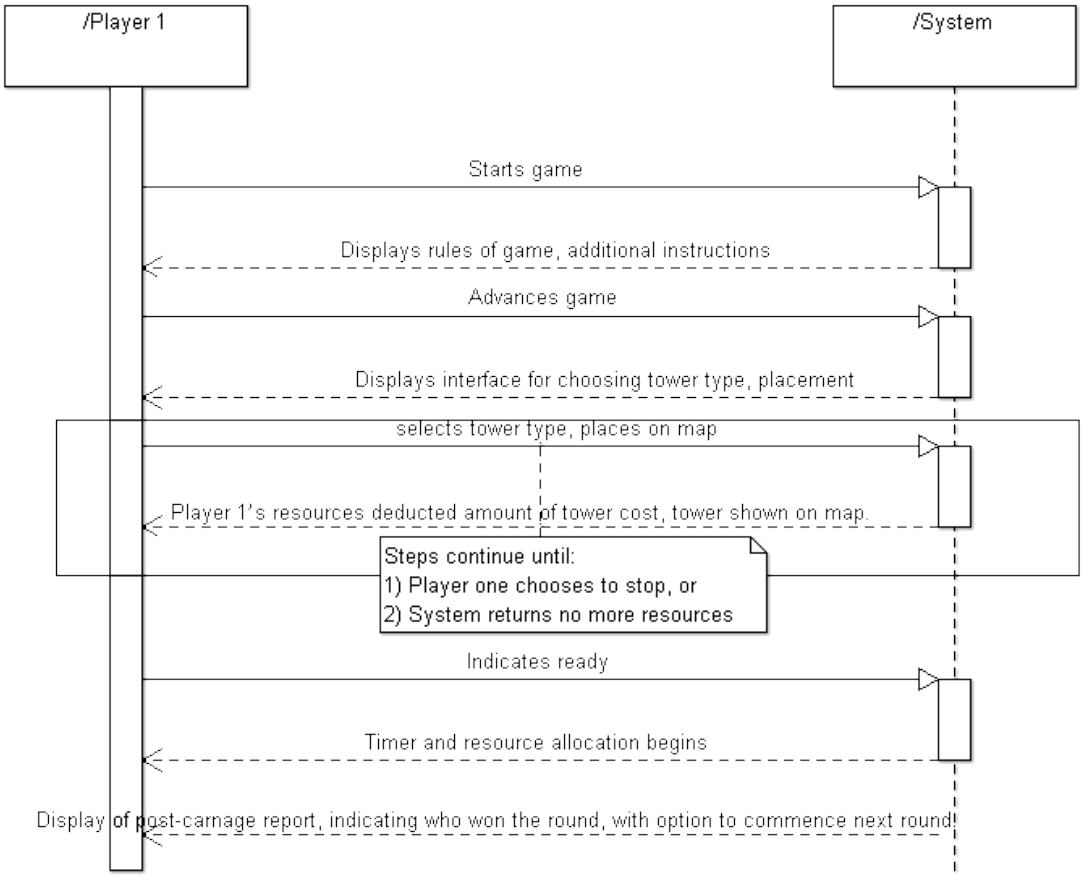
System Features
-- Monster creation (type)
-- Tower creation (position and type)
-- Tower upgrades
-- Monster abilities
-- Money stored in each player's account
-- Timer-controlled cool-down periods for creating monsters
-- Timer-controlled additions to each player's money account
-- Timer countdown for end of level

Other Requirements and Restraints
Level design: Map size and monster route; obstacle detection
Type of operating system: Written in C++ for Linux
Single-machine access: Game is played on one machine without use of the internet

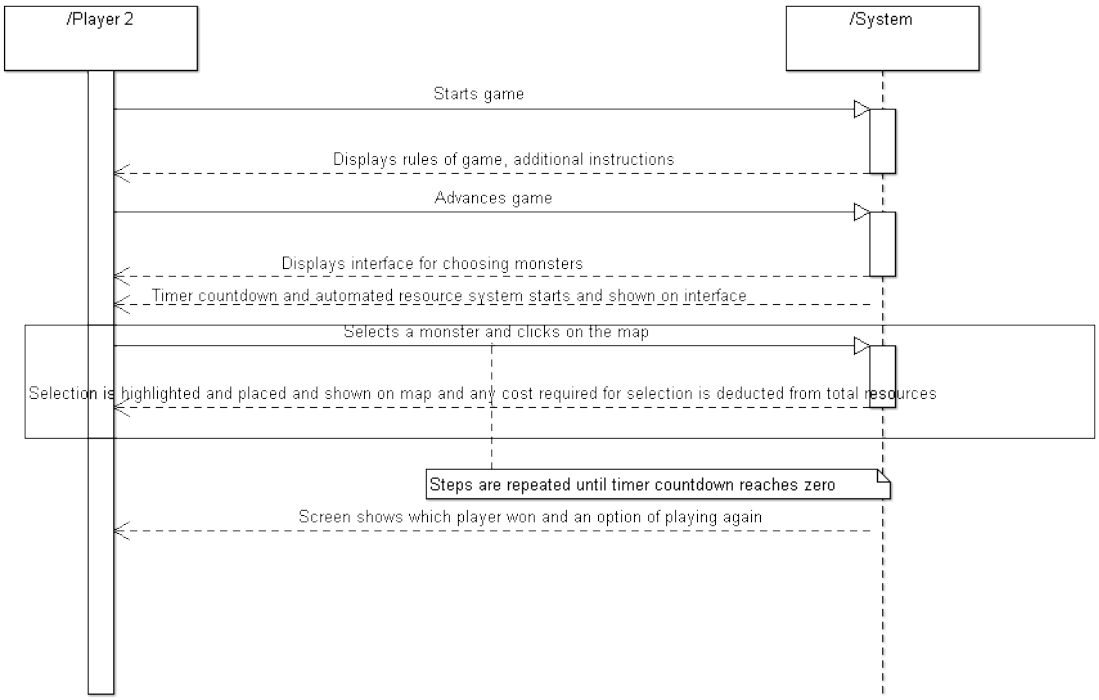
Static Class Diagram



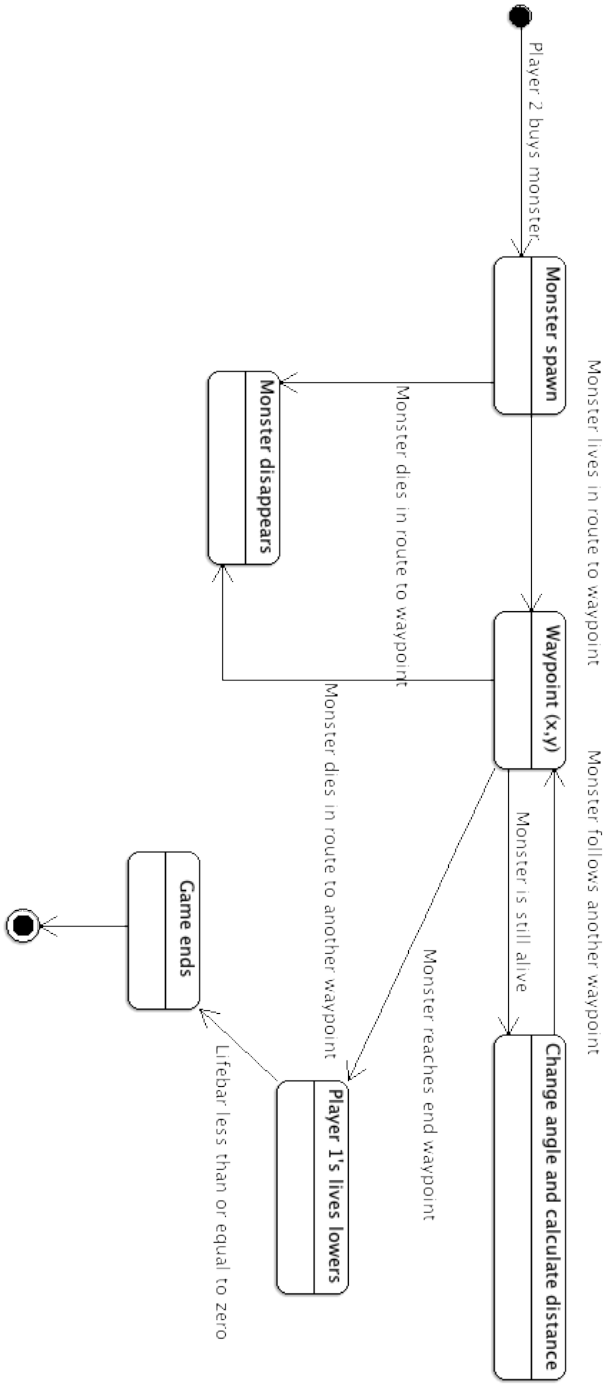
System Sequence Diagram 1: Player 1



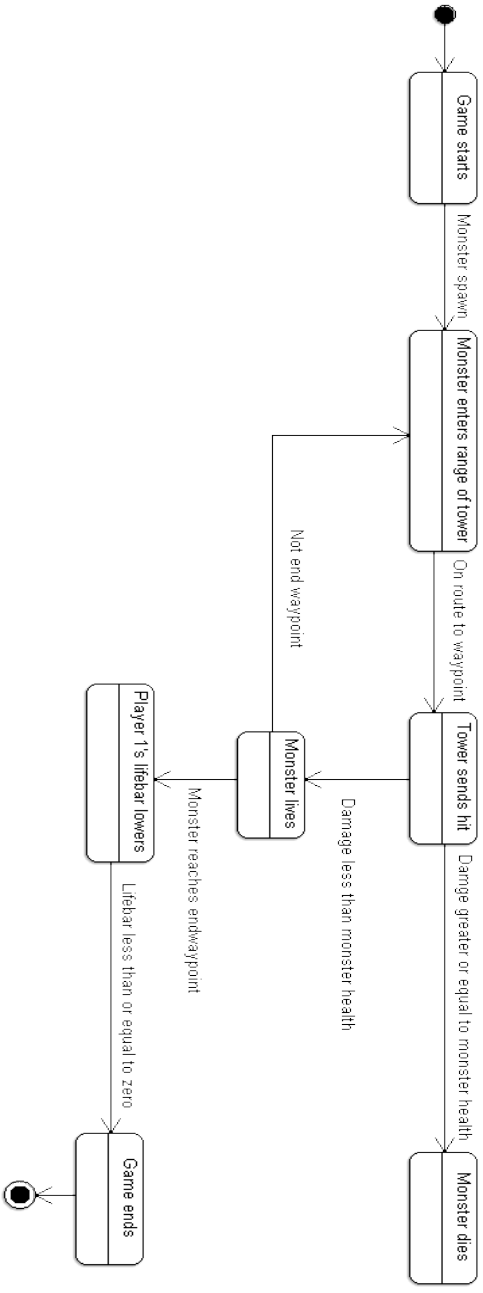
System Sequence Diagram 2: Player 2



State Diagram 1: Monster



State Diagram 2: Tower



Glossary

Term	Definition and Information
Player one	Player who builds towers using the mouse; wins by surviving the allotted time (three minutes)
Player two	Player who uses keys 1,2,3 to select a monster and the space bar to create a monster; wins by reducing Player 1's lives to zero
Statue of Liberty	Has a range of 350, does 5 damage and costs 8 resources.
Eiffel Tower	Has a range of 300, does 3 damage and costs 5 resources.
Pyramid	Has a range of 400, does 10 damage and costs 13 resources.
Slime	Has a health of 60, a speed of 40 and costs 8 resources.
Ghost	Has a health of 25, a speed of 60 and costs 4 resources.
Robot	Has a health of 40, a speed of 50 and costs 6 resources.
Timer	The game is set to a three minute limit.
Map	The area where the monsters and towers interact with each other. Towers can't be placed directly on path.
Path	The route the monsters travel. Towers can't be placed on it.
Resources	Game currency that players can use to build towers or create monsters.
Player One Lives	Record of player one's lives and the impact of damage by monsters. Player two wins once it reaches zero.
Waypoint	The (x,y) coordinates of the path.