Proposal For LaserTank Game

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CSS 450
Project Proposal
Overview
In this game the player controls a tank (LaserTank) in a struggle against invading robotic insects called RoboBugs. The player perspective is from directly overhead. The goal of the game is to destroy all the RoboBugs. The RoboBugs can shoot back, and if the player’s LaserTank is destroyed, the game is over.

The technical constraints are as listed in the specification (1-9).

Objects

LaserTank
The player object will be a tracked, turreted tank armed with a laser cannon (constraint 1). The tank can move in the direction it is facing (constraint 3) and fire under user control. This object will be composed of at least the base objects of ellipse, rectangle, and line.

  Laser Cannon
  The cannon can be rotated in different directions. (constraint 1)
  It can be lengthened, which increases weapon range but decreases power. (constraint 1)
  It can be enlarged, which increases power but decreases range. (constraint 1)
  It has an effective range in which it can do damage.
  It has a power level that determines how much damage is done.
  The laser beam will be an object attached to the cannon.

Figure 1: LaserTank (preliminary)
**RoboBugs**
These are tracked robots of insect like form that can spit fireballs. They can move and fire under computer control. They will be slower and have less range than the LaserTank. This object will be composed of at least the base objects of ellipse, rectangle, and arc. (constraint 2)

![CSS450: TgraphicsObject hierarchy](image)

figure 2: RoboBug (preliminary)

**Fireballs**
The fireballs spit by RoboBugs will be separate objects. This object will be composed of at least the base object circle.

**Boulders**
These are large rocks which are scattered on this world and impede weapons and movement. They are stationary. This object will be composed of at least the base object circle. (constraint 2)

**Explosions**
These temporary objects indicate hits by weapons, and are only visual. This object will be composed of at least the base object circle.

**Views**
Views will always maintain square shape, but size can change if the drawable size is changed. (constraint 7)

**Game View**
This is the largest view, where the game interaction takes place. The LaserTank is always centered in this view (constraint 4).

**Satellite Close-up View**
This is an enlarged view of the area highlighted in the Satellite view.
**Satellite View**
This is an overhead view from satellite of the game world. It has a zoom box that determines the area zoomed into in the Satellite Close-up view. The zoom box’s size and location can be changed. (constraint 7)

![Satellite View Diagram](image)

figure 1: Left box is Game view, lower right box is satellite view, and upper right box is satellite close-up view.

**Mechanics**

**Collisions**
The LaserTank, RoboBugs, and boulders will never overlap. Collisions between fired weapons (laser, fireball) and other objects will result in a visual explosion and damage (constraint 6).

**Movement**
The LaserTank can move forward in the direction it is facing and can change direction (constraint 3 + 5). It will stop if the forward direction is blocked or if it is at the world edge (constraint 4). The player controls the movement. The laser can be rotated separately from the tank movement. The LaserTank is always in the center of the game view.

The RoboBug can move forward in the direction it is facing and can change direction (constraint 5). It will stop if the forward direction is blocked. The computer will then change its direction until it can move again. RoboBug movement can be random if out of visibility range or directed toward the LaserTank if in visibility range. Once it is in weapon range, a RoboBug will fire. It may or may not continue to move.
Global Game State

Pause/Resume
The game can be paused at any time and then resumed. (constraint 8)

Reset
The game can be returned to its starting state at any time. (constraint 8)

Quit
Quit game.

User Interface

Mouse
Game view: LMB causes LaserTank to move towards mouse cursor.
RMB causes LaserTank to fire laser.

Satellite view: LMB causes zoom box to expand when mouse move right and shrink when mouse moved left.
RMB causes zoom box to move to position of cursor.

Other views: no effect.

GUI and Keyboard
(constraint 9)

Buttons: Move LaserTank Forward (‘f’)  Move LaserTank Backward (‘b’)
Turn LaserTank right (‘r’)  Turn LaserTank left (‘l’)
Fire Laser (space)
Reset
Quit (‘q’)

Check Box: Pause/Resume (‘p’)

Indicators(sliders): Damage to LaserTank
Laser Power
Laser Range

Sliders: Laser length
Laser rotation
Laser size
Figure 2: GUI layout