Escape From Orion

User Manual

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Table of Contents

Overview

Storyline

Escape From Orion is a remake of the classic arcade game Asteroids. In *EFO*, you assume the role of a lone space pilot attempting to escape from Orion's Belt back to Earth after the carrier fleet housing your fighter ship was destroyed by a previously unknown alien race. As one of the few survivors, you must reach Earth to inform the leaders of the alien's planned hostilities.

User Interface

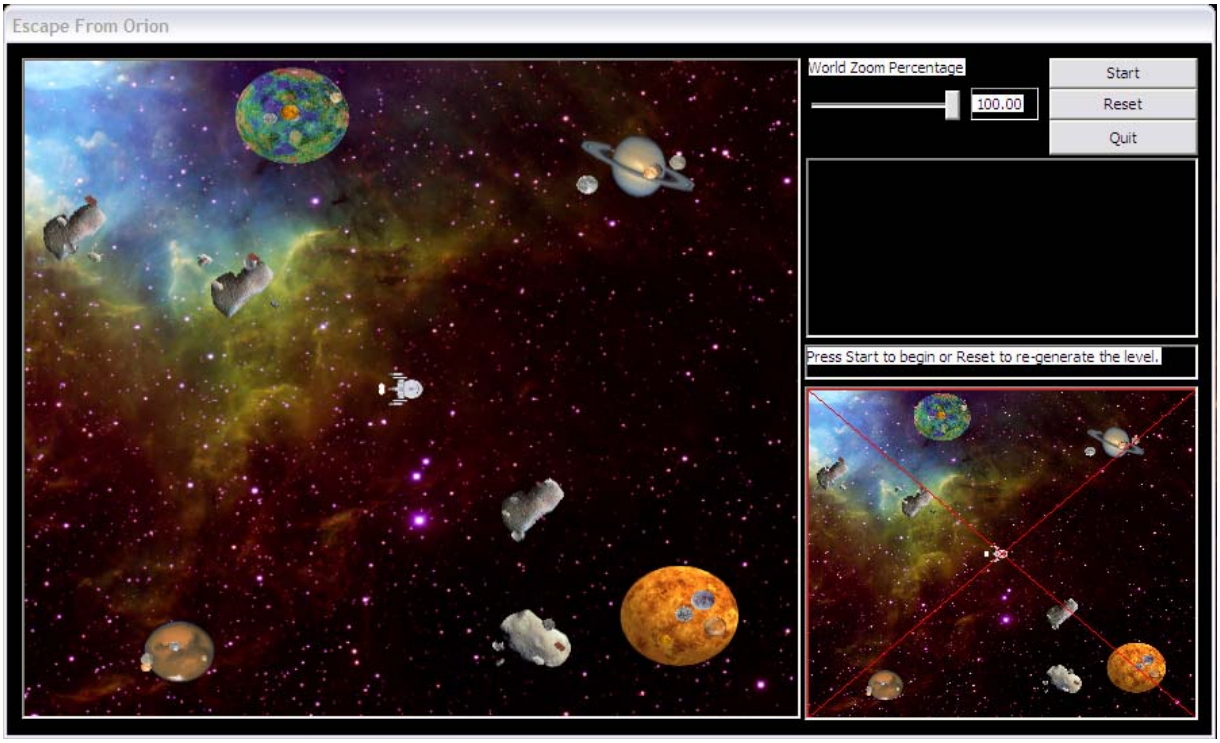


Figure 1: Escape From Orion User Interface

Gameplay

The player advances to the next level when all asteroids are destroyed. With each passing level, the number of asteroids and planets increase, and the asteroids move at a faster velocity. The game ends when the player collides with an asteroid or planet.

Controls

- Hero Control:

  Left Arrow: Rotate Counter-clockwise
  Right Arrow: Rotate Clockwise
  Up Arrow: Accelerate
  Down Arrow: Decelerate
  Spacebar: Fire Weapon
  Left-Click: Teleport

- World View Control:

  Left Click: Pan view window to click position
  Left Drag: Drag view window
  Right Drag*: Zoom in/out
  * = Slider bar provides more accurate control

- Application Control:

  Start: Starts the game
  Pause/Resume: Pauses and resumes the current game respectively
  Reset: Resets the game to a randomly-generated Level 1 layout
  Quit: Quits the game
  World Zoom: Specifies the zoom control of the view from the world

Hero Object

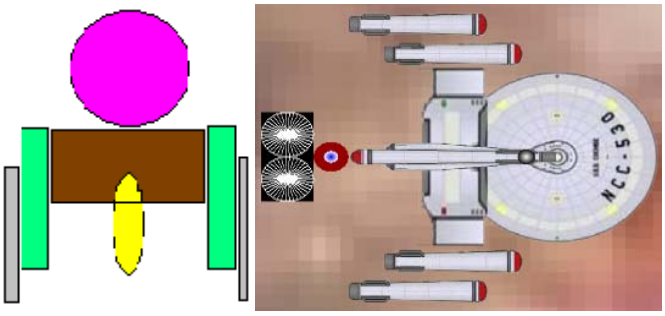


Figure 2: Primitive Ship Layout and Texture Mapped Layout

Behavior

The Hero Object is the pilot spaceship embarking toward Earth. It rotates in space with the left and right arrow keys and accelerates or decelerates with the up and down arrow keys respectively. Reverse velocity is impossible. A gradual 5% deceleration exists on the ship's velocity. When clicking within the View window, the Hero Object teleports to the click position. When colliding with the world boundary, the ship's velocity is reversed and it "bounces" off the edge.

The Hero Object is composed of a rectangular hull with attached rectangular wings and circular helm.

The Hero Object can defend itself by shooting bullets to destroy Asteroids. When a shot is fired, a sound effect plays.

Interaction

If the Hero Object collides with an Asteroid or a Stationary Planet, the Hero is destroyed. If the Hero Object collides with a wall boundary, that component of its directional velocity is reversed.

Data Structure

See Appendix.

Supporting Objects

Asteroids

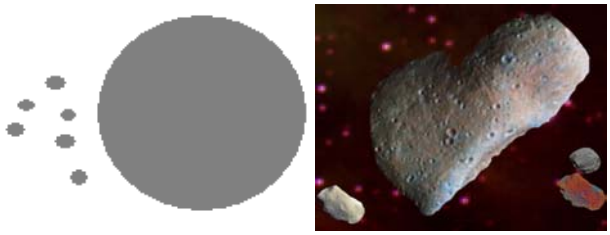


Figure 3: Asteroid Appearance

Behavior

A random number of Asteroids will enter the universe at level creation, each with randomized velocity. Smaller meteorites will trail each Asteroid. The quantity of Asteroids will increase with each level.

Interaction

When an Asteroid collides with another Asteroid or a Stationary Planet, the Asteroid will bounce off in a collision direction unharmed.

When an Asteroid collides with the Hero Object, the Hero Object is destroyed and the Asteroid is unharmed.

When an Asteroid collides with a bullet from the Hero Object, the Asteroid splits into two smaller Asteroids with a radius half that of the original and X-Y velocity components swapped. When fired upon again, the asteroid piece is destroyed.

Stationary Planets

Figure 4: Stationary Planet Appearance

Behavior

A random number of Stationary Planets will enter the universe at level creation with zero velocity. Each Stationary Planet will have 2 to 4 moons which will move around near the 2D constraints of the Planet to simulate orbit. The quantity of planets will increase with each level.

Interaction

Stationary Planets do not cause any direct interactions as they have zero velocity.

When the Hero Object collides with a Stationary Planet, the Hero Object is destroyed and the Stationary Planet is unharmed.

When an Asteroid collides with a Stationary Planet, the Asteroid reflects off the planet in a collision direction and the Stationary Planet is unharmed.

When a bullet collides with a Stationary Planet, the bullet is destroyed and the Stationary Planet is unharmed.

Known Bugs

View Box

When zooming via the slider control, the view box automatically centers to the center of the world geometry. The view box is still pannable, however, and will also automatically center on the Hero Ship's location when the Hero Ship is moving. The view box is not pannable when the ship is moving.

Moon Movement/Placement

Occasionally a moon will get stuck within a planet and "twitch" back in forth instead of orbiting. Additionally, when an asteroid splits too close to a planet, sometimes the resulting smaller asteroids can get stuck within the planet bounds.

Limitations

View Box

The view box can extend beyond the edge of the world when panning via mouse, and also displays beyond the world edge when the Hero Ship approaches the edge instead of stopping and letting the Hero Ship lose center control and continue traveling. This is partially masked by extending the background image beyond the world view so that the dead space is never seen by the user.

Unimplemented Features

Bounding Volumes

Future versions will opt for bounding circles for greater accuracy.

World Wrap

In the current version, the Asteroids and Hero Ship unrealistically bounce off of the edges of the world. In a future version, the Asteroids and Hero Ship will wrap around the world edges like the arcade classic. Additionally, when an Asteroid collides with a Stationary Planet, no harm is done to the Planet. A future version will include destruction of the planet and/or moons.

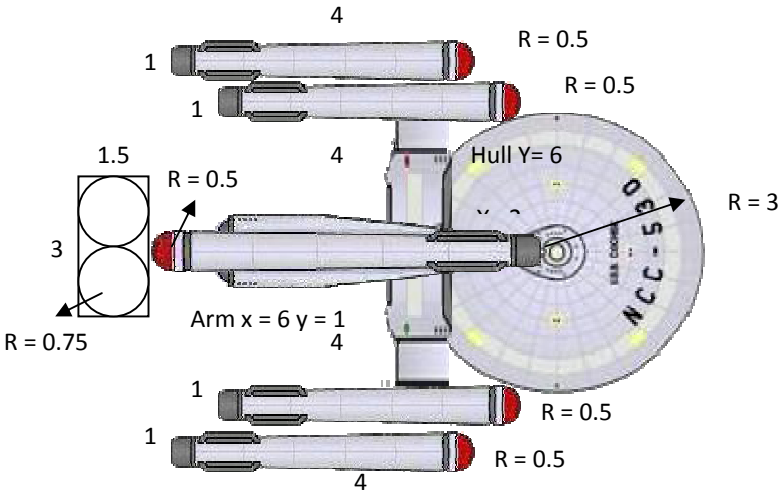
Limited/Recharging Teleportation

In a future version, the teleportation will be limited in that it takes several seconds for the teleportation module to recharge, thus preventing the ship from simply teleporting anywhere in the world to destroy the Asteroids.

Multiple Lives

The current version only gives one "life", which makes the game easy to lose. A future version will allow multiple lives, with each new life starting back at the world center on the current level while maintaining planet and asteroid placement and velocity.

Appendix A: Hero Object Schematic



Appendix B: Hero Object Data Structure