

Retro Asteroids

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There are different versions of Asteroids available, and I am using the original 1979 version as reference.

The following descriptions is for the implementation of the classic gameplay.

1. GAME DESIGN

a. Player goals and objectives

The goal is to shoot as many asteroids as possible before player lose all his lives. This involves shooting asteroids to get scores and surviving longer to possibly get more scores.

b. Challenges and conflict

Source of conflict are asteroids and alien ships. Colliding with any of asteroids, alien ship or enemy bullets will destroy the player ship and player lose one life.

Inertia exists in game physics and controlling the ship to avoid the asteroids and alien ships is a challenge.

Player needs to use rotation to aim precisely and predict the movement of both the target and player's bullet to hit, which is a challenge.

Asteroids have their velocity and move on screen. Large or middle asteroids spawns smaller and faster asteroids upon their destruction which is another challenge for player to control the amount of asteroids in the space.

The repeating game space itself is also a challenge for players to master.

c. Constraints and boundaries

The player ship is constrained by the 2-dimensional rectangular gameplay area. If the player ship (and also for any other in-game object) travels off the area from one side, the ship will appear at the opposite side.

Player has a set number of lives. If the player ship is destroyed that number of times, the game ends showing the text "Game Over", then enters the score screen.

The number of player's bullets on the screen is restricted by a firing timespan (although original 1979 version restricts it by a maximum number of 4). This restriction may change during balancing process.

d. Resources

Player gains an extra life for every 10000 points earned.

e. Detailed description of the rules, including win/loss conditions

When the game is started, player enters the gameplay scene. Player ship will spawn at center of the game area along with a few randomly spawned large asteroids to the side drifting in various directions on the screen. Every object warp to the opposite side of screen when running into screen edges.

Player can rotate, accelerate and shoot. Player's ship has inertia. Once the player's ship begins to move in one direction, it will continue to move until player gives a thrust at opposite direction.

The player ship will get destroyed by any of the following ways:

- 1) Running into an asteroid.
- 2) Running into an alien ship.
- 3) Being hit by an alien bullet.

In any of these conditions player will lose a life and the ship will respawn at center (with a short period of invincibility). If player's life counter reaches zero, the game ends showing the text "Game Over", then enters the score screen.

There are 3 kinds of asteroids:

- 1) Large asteroids move slowly, value 20 points on hit and spawn two middle asteroids.
- 2) Medium asteroids move faster, value 50 points on hit and spawn two small asteroids.
- 3) Small asteroids move fastest, value 100 points on hit.

Every few seconds (based on current "level" – the difficulty based on current score), an alien ship will spawn. It flies across the screen sinusoidally while shooting bullets. There are two kinds of alien ships: the large one and the small one. The large one shoots in random direction while the small one fires more often at player ship. After reaching a score of 40000 only small one appears.

When all asteroids and alien ships are destroyed, the difficulty ("level") will be increased according to current score. Asteroids will respawn and the amount is larger according to the current difficulty. Alien ship also spawns faster.