

Assignment 2 - 2D Game Implementation

Instructor: Nicolas Bergeron, bergeron@encs.concordia.ca
Due Date: Sunday, October 9, end of day
Worth: 15% of your final grade
Advice: Start early, do a minimal version of everything, and polish when everything is functional.

Overview

Star Force is a vertical side-scrolling shoot 'em up game released by Tehkan (now known as Tecmo) in 1984 on the Nintendo Entertainment System. In the game, you pilot a spaceship, avoid obstacles and defeat various enemies. The goal of the game is to survive and defeat as many enemies as possible in order to beat the High Score.

Your first assignment in Unity is to develop a variation of Star Force. In the variation, your space ship is much smaller and less likely to be hit by an enemy. It is composed of a tiny circular core (only a few pixels wide) surrounded by a colored halo. Enemies always come in waves of 5 units. After defeating a whole wave, a weapon upgrade power up is dropped allowing you to shoot an extra bullet. The level ends with an epic BOSS fight!

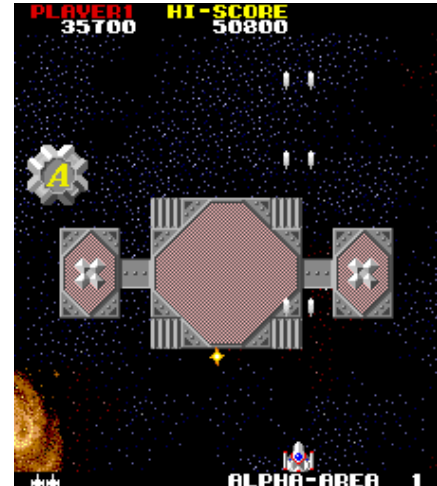


Figure 1- Star Force (NES)

Game Modes

You have to develop two modes of the game as follows:

- Normal Mode – In this version, the basic version of the game is implemented as below. The game ends when the player dies, or when you beat the Boss at the end of the level.
- Bullet Hell Mode – This game is a variation of the game described below. In this game mode, bullets not touching an enemy will wrap around the screen for up to 3 times. If a bullet reaches the top of the screen, it will re-appear at the bottom of the screen. If it reaches the left side, it will re-appear on the right side (similar to the game Asteroids). This makes the game more difficult because the player can be hit by its own bullets.

User interface and game play parameters

- Design your own user interface using keys for manipulating the spaceship, shooting bullets, etc.
- The main screen shows the game name (find an original name). To start a game, the player selects his favorite game mode explained above.
- In-game HUD: The current score should be displayed on the screen, as well as the health of the BOSS during the final BOSS fight.
- You will have to suitably adjust your gameplay parameters, such as number and rate of enemies, size of enemies, the speed and size of the ship, the speed and size of the bullets, so as to yield a compelling playable game.
- Remember there should be feedback (audio, particle effects) for every important action in the game (being hit, picking up a power up, defeating an enemy, etc).

Basic Game Play

- When the game starts, the spaceship is launched from its base. At this point, the screen starts scrolling vertically, you can control the position of the spaceship and fire a bullet by pressing the fire button. Enemies will soon start attacking the player.
- There are 2 types of enemies within the game which lasts approximately 30 seconds
 - Enemy ships A: They move almost in straight line from the top to the bottom of the screen in triangle formations containing 5 ships
 - Enemy ships B: They move in line formations of 5 ships starting from the top right corner of the screen (or top left) and move towards the bottom of the screen in large sinusoidal trajectories. Each enemy ship B shoots a bullet towards the player spaceship at a given time.
 - Enemies are killed by a single bullet. Defeating enemy A increases the score by 100 points, and enemy B by 200 points. Defeating a whole wave give 2x bonus.
- When an enemy wave is completely defeated, a power-up is dropped in space. The player can pick it up to upgrade his weapon as follow:
 - Upgrade 1: Double bullet – 1 extra bullet beside the original one
 - Upgrade 2: Triple bullet – 2 extra bullets on the left/right of the original with a direction of ± 25 degree angle.
 - ...
 - When the player is hit by an enemy or a bullet, his weapon is downgraded. If the player has no upgrades, it is Game Over and the game goes back to the main menu.
- Boss fight: After you survive the 30 seconds of gameplay, the screen scrolling will slow down for 3 seconds and eventually stop. Then, a powerful enemy Boss will show up from above. The Boss creates deadly rounds of attack. To beat him, you shoot his 2 glowing weak points which must be hit 2 times each. The core of the Boss will then open for 5 seconds. Shoot the core to inflict damage. After the 5 seconds is expired, you need to re-open the core by shooting the weak points. During the Boss fight, the player can see the Boss health, you need to shoot the core ~ 15 times.

Deliverables

Complete game project source code along data files and a README file explaining how to read the code, compile, run, and play the game on a PC with Unity. Please zip all your files into one archive and submit a single file.

Demo your game to the Lab Instructor and answer questions on your Unity programming skills/experience during lab hours on **October 11-13**.

Evaluation

- Working implementation of Normal mode with all game play (40%)
- Working implementation of Bullet Hell mode with all game play (15%)
- Setting and playability (User Interface, Controls, Enemies) (20%)
- Aesthetics and overall impression (10%)
- Q & A (to demonstrate understanding of Unity programming) (15%)

Ground Rules

You are welcome to discuss high-level implementation issues with your classmates and others, but you should avoid actually looking at other students' code as whole, and under no circumstances should you be copying any portion of another student's code or copying complete code from the Internet. However, seeking help from other students for debugging some portion of your code is reasonable. Basically, these "ground rules" are intended to prevent a student from "freeloading" off another student or from the Internet, even accidentally.