

Project Description for ECE 338

Assigned: Oct. 23

Additional due dates specified below.

Description: Video Game implemented in VHDL

You will work in groups of 2 to implement a game on your FPGA boards. The project leverages the work you have done in the labs, namely the push buttons, leds, switches and HDMI. You can optionally use a C program to control the game.

If you choose to implement a game that is not the default, you must provide a proposal to the instructor by the start date of the project on what you intend to do.

Default Game: ALIEN CONTROLLED ASTEROIDS

Some guidelines:

- The space ship must respond to user controls for both movement and attack operations
- Attack operations must include firing missiles
 - Optional: Firing operations may also involve firing 'cluster bombs' that destroy all asteroids within a fixed radius (you should limit how often a user to use cluster bombs)
- Alien controlled asteroids touching the space ship cause it to explode and disappear
- User is given three space ships initially and must keep the number above 0 otherwise the aliens win the game. New asteroids appear after they are destroyed
- Optional: An alien spaceship can be added that is under control of a second player
- Your game must include multiple randomly moving or intelligently (alien-controlled) asteroids
 - Optional: The number of asteroids can increase in number and speed as the game progresses
 - Optional: Asteroids can gravitate automatically toward the space ship
 - Optional: Asteroids can be directed by an alien, which is controlled by a second player
 - Optional: You can add additional space ships after the user destroys a fixed number of asteroids

Part I: (First day of project) Prepare a proposal of what you will implement, identifying an optional components from the above list, or any alternatives you come up with. The game must have both a graphics component and a computation component. Computation at a minimum is keeping score, but can be more interesting such as computing the mean and standard deviation of other game related activities such as the number of times the user moved left or right or fired at the asteroids. You can also add physics-based gravitational behavior.

Part II: (End of week 2 of Project) Simple graphical images of the asteroids moving randomly (similar to the ball in the pong game) and a space ship moving about on the screen under user control (similar to the paddle in the pong game).

Part III: (Project due date) FINAL HARDWARE DEMO preceded by a short (5 minute) presentation of your game (2 to 5 slides) illustrating its features, and things you wanted to add but could not get to work or didn't have time to add. You are required to turn in a copy of code.

Project Report Requirements

Every Wed., you need to turn in 1 paragraph (up to 1 page) report describing what you worked on and what features you have added to the game. The report should be cumulative, with the date included above each new section that you add each week.