i. Abstract

The main goal of the project is to implement a video game Snappers which was originally developed by Mikhail Eliseev in 2011. The project will be implemented on Altera Cyclone II FPGA with the development of the game strategies done in a combination of both hardware (in VHDL) and software (in C).

ii. Introduction

The game we intend to design in this project is a single player video game and we have this game application running on one machine. The object of a typical game would be to clean the snappers (which can be designed into any different configuration compare with the original game) in the screen. We will be mapping the position of snappers, the players’ hit times and we have a screen somewhat similar to the original game base. The application will be a C program that will control the application layer of the design and VHDL describes the necessary hardware for it. The players will learn how to play by following the tutorial instruction. It requires thinking, determination and trial-and-error. Here is the original sample of this game:

iii. Design Of The Game

We plan to implement the following interfaces and features for the game:

- Two changes to hit on the snappers and snappers will explode after one or more hits.
- Each explosion will produce four bullets in horizontal and vertical
directions and each bullet will have
the same effect as one hit on the
snappers.

- Snappers with different colors will
  need different times of hit to
  explode
- Implementation of design controls
  for respective players using the PS2
  keyboard as that would be easier to
  control for the players

iv. Actions and Milestones

Action 1/Milestone 1
The very beginning step will be setting up the
peripherals of the project and hardware. After
that we have to establish the model of
snappers (of different levels), bullets and the
background.

Action 2/Milestone 2
In this stage the VHDL programming part will
be studied in detail. Then we will implement
some basic features of this game, for example:
exploded snappers can reject bullets and when
the bullets meet snappers, the snappers will
explode after enough hits.

Action 3/Milestone 3
The goal of this action is to add other features
such as sound and animation effect (if
possible). And there will be tutorial instruction
and several levels of this game.

Action 4/If time permit
Adding features:
Ethernet-based game between two players
over two different machines: two players
begin to play at the same time, and compare
the results. The player finish more levels wins.
If the levels are the same, then compare the
time used. The player that uses less time wins.