Achtung die Kurve

(MULTISNAKE)

02321 HW/SW Programming
January 2013

Game description

Introduction

Our project is a multiplayer game, where two snakes compete against each other.
They are not allowed to move into each other, or the wall - if this happens, the other player wins.
The game is implemented on a FPGA board with a LC3 processor, which we build from scratch.

Rules and advises

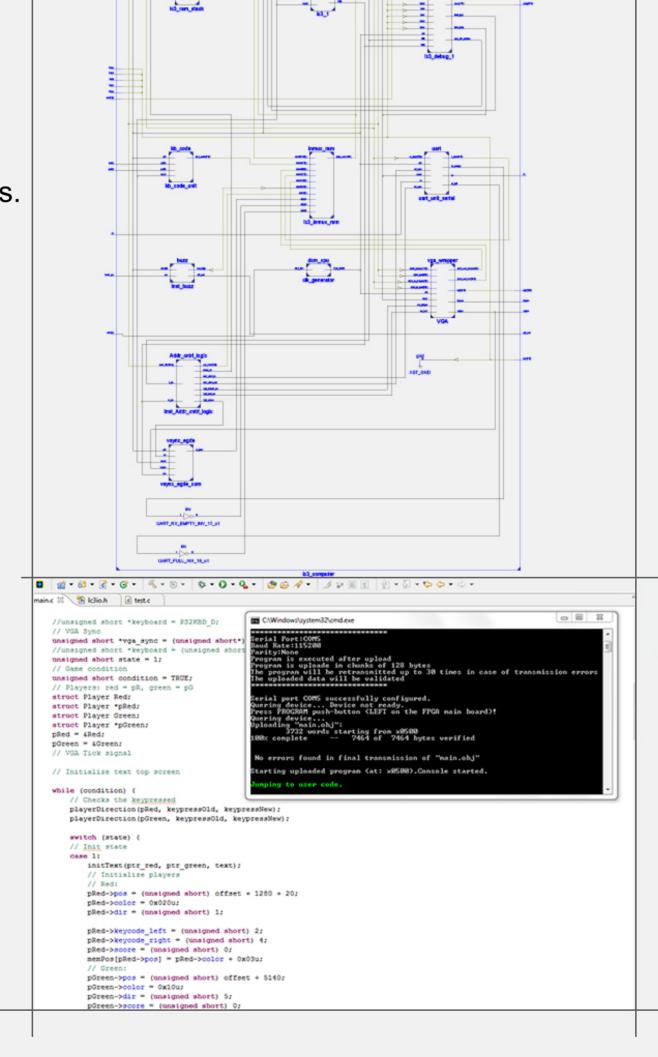The game is played using either a keyboard or Buzzers.

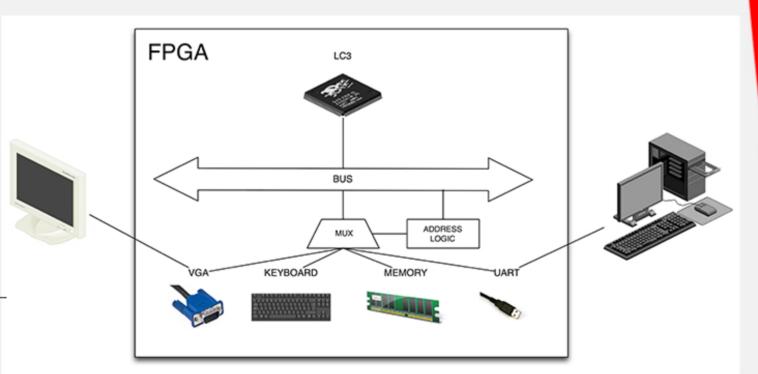| Keyboard controls	Buzzer controls
Player 1 left: Z	Player left: Yellow Button
Player 1 right: X	Player right: Blue Button
Player 2 left: N	
Player 2 right: M	

Original "Achtung die Kurve" game.
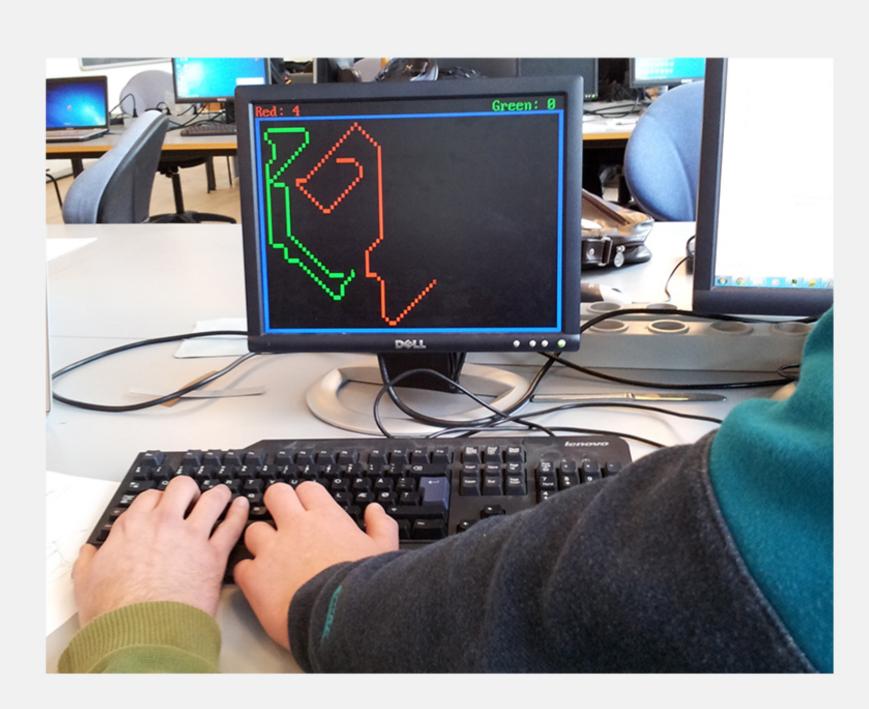
System description

I/O communication

Our system works using the following I/O devices:

- **Keyboard** for controlling the snakes
- **Buzzer** for alternative controls
- **Monitor** for displaying the game

Memory and memory mapping

Another important topic when designing a computer is the decision for memory allocation and memory mapping. Each I/O device e.g. has it's own unique address from where the user can access its data. Also memory is very sparse in our system, so we had to find a fair distributon of memory space between the different devices.

Out complete setup system with the game running.

VGA controller

The VGA controller has a very important role in our system, because it regulates *how many **colors*** are available, the ***VGA memory size***, the *different **graphic patterns*** we may use and *setting the correct **resolution***.
Everything mentioned is implemented to draw, and keep track of, every single pixel on the screen. Some parts of the screen are static while others, e.g. the snakes and the scores, are dynamic. Most of the graphics used are stored in different memory locations, and some static graphics are stored in ROMs in the VGA Controller.