Vrije Universiteit Brussel

Sensors and microsystem electronics

Project microcontroller: The dinosaur game 'The dino says Graaah!'

Authors:
Jacobs Johan
Royen Remco

Supervisors:
Ir. Deleener Robin
Ir. Lapauw Thomas

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Contents

1 Introduction

The goal of this project was to program a microcontroller in AVR 8-bit assembly language. We decided to program a game on the microcontroller, where you play as a dinosaur exploring the desert. While you are running through the desert you have to dodge all of the cacti you come across. If you hit a cactus, you will die and lose the game.

2 Game manual

Press button A to start the game.
Press button 7 to jump over an incoming cactus. Holding down the button will let the dinosaur stay up in the air a bit longer.
As the game progresses, you will run faster and faster, making it increasingly difficult to survive. On top of that two special modes are introduced: the so-called 'extreme' and 'insane' mode. Initially the dinosaur is standing at the left side of the screen. At certain points in time, the gameplay will be mirrored. This means that you will be at the right side of the screen and the cacti are moving towards you from the opposite direction. Of course also the stream of cacti is inversed such that the cacti that were close to you, remain close. This is the so-called 'insane mode'
The second special feature that was implemented is the 'extreme mode'. When entering this mode, the LEDS from the dinosaur and cacti will be turned off while the other LEDS are turned on.
Of course the goal is to survive as long as possible, get the highest score and defeat all of your friends! Good luck!

3 Block schematic

The code is divided in 1 '.asm' file, 'main.asm', and 7 include files that each regroup functions that are semantically linked. This makes the code a lot more readable. The block schematic can be seen in Figure 1. One can clearly see the hierarchy between different blocks. Of course the interrupt file is able to interrupt in every block and is hence on top in the hierarchy.
The code is well commented and by use of this schematic and the comments in the code we hope that the program is well understandable.

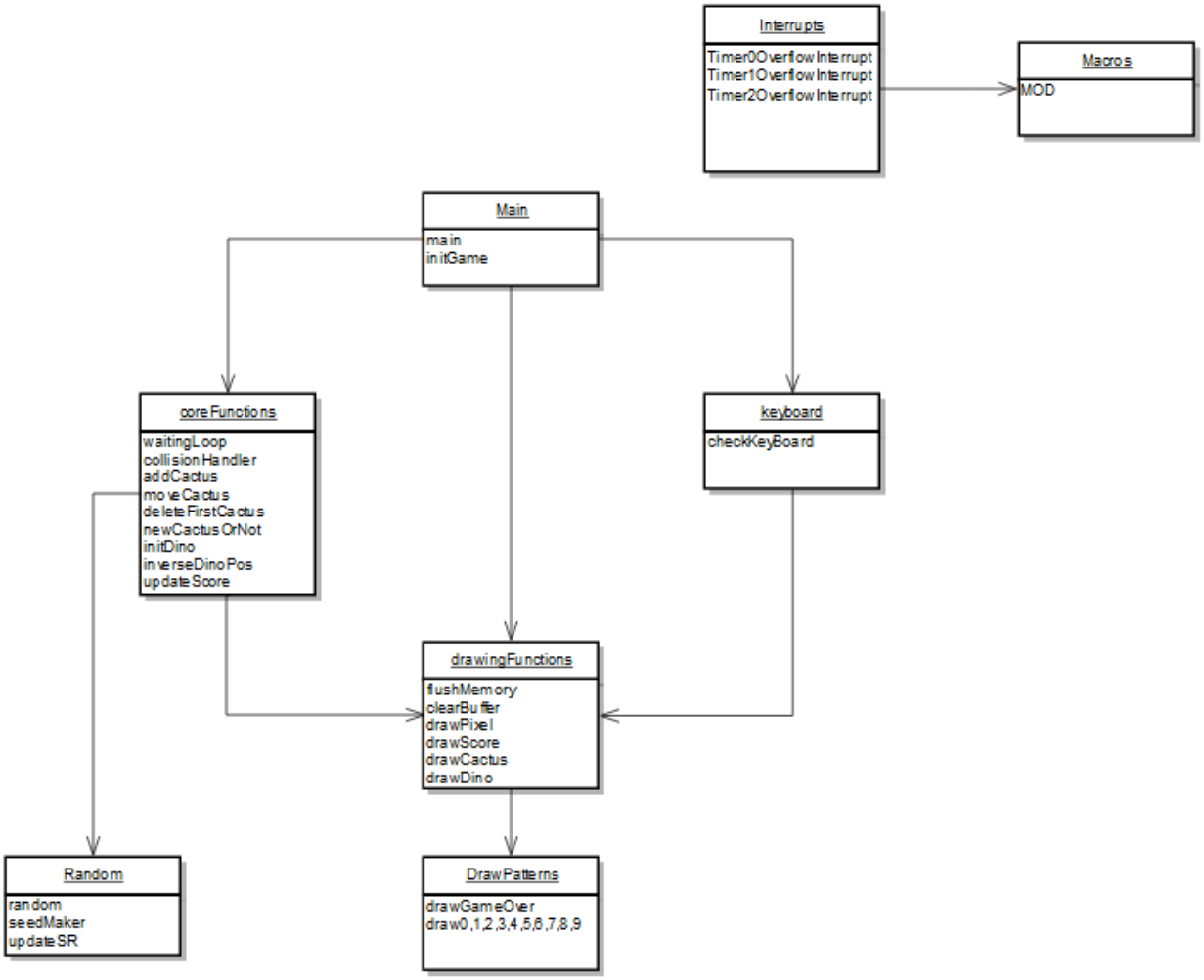

Figure 1: Block schematic of the code