

A Motion Controlled Snake Game

By Sven Svensson (861021-7112) and Anna Karlsson (840707-1277)¹
2015-10-21

Objective and Requirements. The purpose of this project is to develop the classic “snake” game on an embedded platform with limited resources. In this game, a snake is growing on the screen, and the challenge for the players is to make the tail of the snake grow as long as possible. The main *must* requirements for the game are as follows:

- The game must support multi-player mode and high score lists.
- It must support different difficulty levels.
- The user must be able to control the game with the buttons on the ChipKIT board.

Optional features that *may* be included, if time allows:

- To control the game using an external accelerometer. The sensor is communicating with the main board using SPI or I²C.
- To use the A/D converter together with an external speaker to generate sounds for the game.
- Enable multiplayer mode where two players with different ChipKIT boards can play with each other. The UART will be used for serial communication.

Solution. We intend to develop our project on the ChipKIT Uno32 board together with the Basic I/O shield. We will use the small display on the Basic I/O shield to display the game and use the slide switches to move in the vertical direction, and the push buttons to move in the horizontal direction. We will use interrupts triggered by the built in timer to update the screen and control the speed of the game. All the development is done using the MCB32tools and all code is written in C.

Verification. We intend to verify the program by performing extensive testing. We will focus on system testing, where we systematically define different test scenarios. In particular, we will consider corner cases, such as when the snake hits the walls, when incorrect button combinations are used, and when we accelerate the board in unexpected behavior. We intend to write down a short test specification with the most important test cases.

Contributions. We intend to divide the work in the following way: Sven will focus on the development of the graphical display and the sound generation. Anna will work on the program logic, the main game engine, and the interaction with the accelerometer. The final division of work will be explained in the final report.

Reflections. In the final abstract, we will discuss and reflect on what happened in the project.

¹ This is *an example* of an extended abstract. It does not describe a real student project. Note that this version of the abstract corresponds to the DRAFT that is submitted in the middle of the course.