Tianjin University – Sensor Module – 2018

Motion Sensing Project Design Document

Controlling a video game with motion sensing

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Introduction

You can see the project at the following github page:
https://github.com/Xiphrin/Arduino_Sensor_2018

Project description

The Aim of this project is to show a use case example of the motion sensing detection technology. More precisely we chose to create a simple video, namely a block-breaker (https://en.wikipedia.org/wiki/Brick_Breaker), and thanks to a motion sensor detects the movement of the player, allowing him to have a seamless experience.

Technology used

To realise our project, we needed the following technologies:

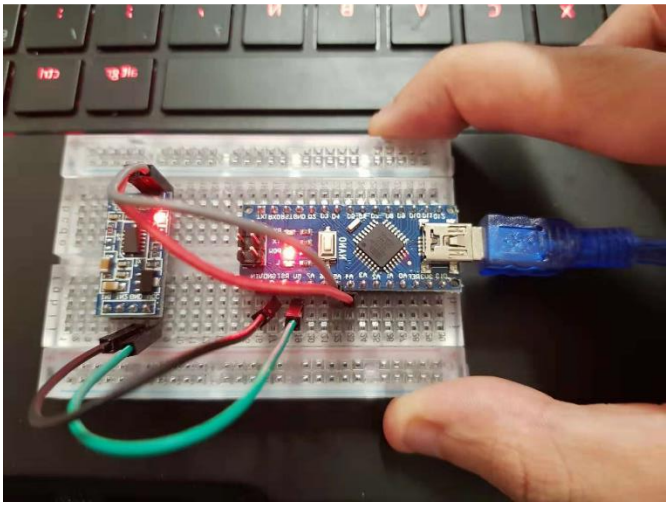
On the Hardware part:

- One Arduino nano board (https://store.arduino.cc/usa/arduino-nano)
- One MMA7455 Accelerometer (https://www.nxp.com/docs/en/data-sheet/MMA7455L.pdf)

On the Software part:

- A knowledge of the C language, as it is mandatory to develop on Arduino board
- A knowledge of the C# language, because we decided to use the Unity Engine to do our game and the C# language is used by this engine (https://en.wikipedia.org/wiki/Unity_(game_engine)).

Montage



Accelerometer (to)	Arduino
GND	GND
VCC	5v
SDA	A4
SCL	A5

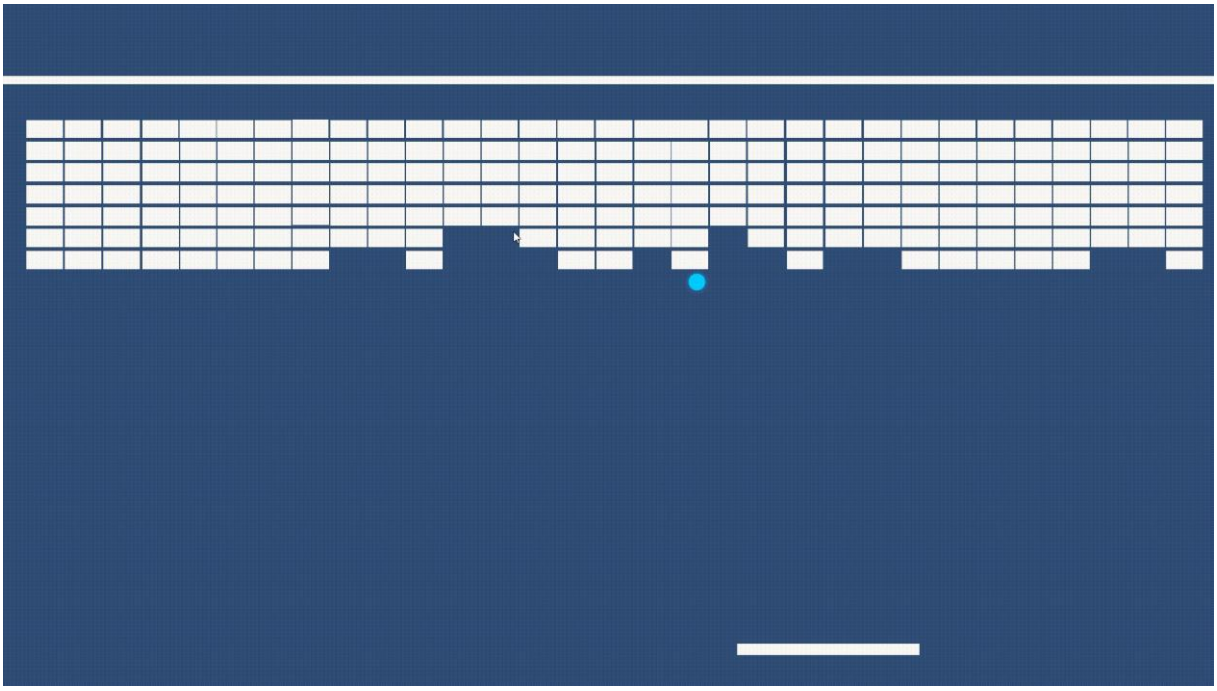
Here you can see an array explaining to which pins the MMA7455 accelerometer and the Arduino board must be linked.

As you can see on the left it is a simple montage.

Result

A video game controlled by a “gamepad” which is our montage (the MMA7455 + the Arduino board).

The racket, representing the player is controlled by tilting the “gamepad” on the left or the right.



Difficulties encountered

The result of our project is far from what we hoped to accomplish and thus for three reasons:

- We took too much time deciding which sensor we will use
- Testing our sensors was also much more time consuming than we intended
- Communication between the Arduino board and Unity even if simple to make can be a big source of errors.

Conclusion

Even though we did not manage to give to our player a seamless experience we were still able to experiment with motion detection technology.