

Pong

Relatório Final do Projeto de Laboratório de Computadores

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1 What was our goal? What is our application?

Our goal with this project was to create a game that allowed us to implement the device drivers (Timer, Keyboard, Mouse, and Graphics) developed during the practical classes and studied in the theoretical classes. With this in mind, we decided to create our own version of Pong.



2 How did we structure the project?

We structured our project in layers to ensure a better decomposition into distinct sections, allowing for greater modularity. This approach made it easier to add new functionalities or modify existing implementations.

The device drivers are stored in the "devices" folder, with each driver having its own sub-folder containing both the *.c* and *.h* files.

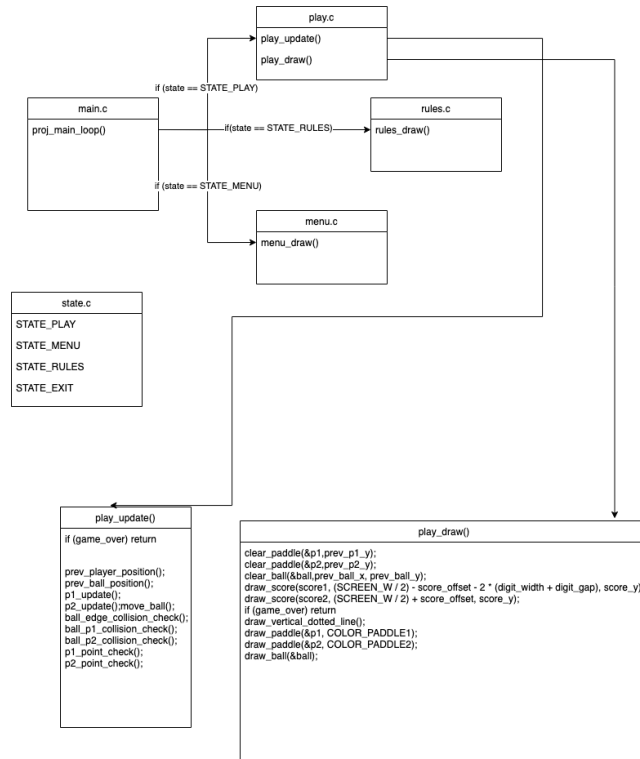
The "i8042.h" and "i8254.h" files are located in the "controllers" folder.

The "utils.c" file is placed in a dedicated "utils" folder.

All of our XPM files are organised in the "xpm_files" folder. This structure allows us to easily add new XPM files by simply placing them in that folder, helping to keep our codebase well organised.

We decided to keep our game logic and states in the same folder: *game*. This way, we have our entire project well organised in different sections, while only keeping the "main.c" file, in our source root folder.

Here is an architecture image of the structure of our project:



3 What devices did we use and for what purpose?

- **Timer:** In our project the Timer device is of great importance. It is responsible for keeping the game running at a constant rate of 60 frames per second. This ensures our game runs at a stable and smooth state, visually and internally.
- **Keyboard:** The keyboard has different functions on our game, one of which is to navigate the main menu and other menus, but the main function is to move the blue paddle in the game. During play, the keyboard allows the user to use the up and down arrow keys to move the paddle and avoid the ball getting into his goal.
- **Mouse:** The mouse device has a single purpose, that is, to move the red paddle and to allow the user to move it by pressing the right or left buttons to move the paddle up and down and prevent the ball from reaching his goal.
- **Graphics:** The graphics device also has a major place in our project, since it is responsible for drawing every visual aspect of our game, such as the main menu or the play screen. It works hand in hand with the timer for the game to be able to draw 60 times every second the play screen for the game to have a stable and smooth visual effect.

4 What are the differentiating features of our project?

The differentiating features that our version of Pong has from the original Pong are: firstly, our pong has much more colour; paddle 1 is blue and paddle 2 is red; secondly, our game has the ability to have one paddle move by the keyboard input (the arrow keys) and the other by the mouse input (left button goes up and right button goes down).