

CS-107 - Second Programming Project

Readout of the additional implemented features

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Abstract

Making a video game always represents a tough challenge for any programmer, at any level of experience, imposing him to deeply think about the user's final perception and reception of the audiovisual experience he or his team is aiming to provide.

Through ICWars we do not, indeed, aim to provide a high-end product, a fact which is imposed by the time constraints of the project, nonetheless, we wanted to illustrate how a high quality educational programming with a medium technical *craftsmanship* can allow us to deliver a ludic video game, with features that can barely be compared to those you may have encountered on the market in the 90's.

Graphical User Experience Improvements

The first contact of the user is crucial when evaluating an entertainment experience, a reason why we have introduced basic but deep graphics, and a slight sense of humor from the beginning of the game, which allow the user to familiarise himself with the context and inform him over the different levels our game provides.

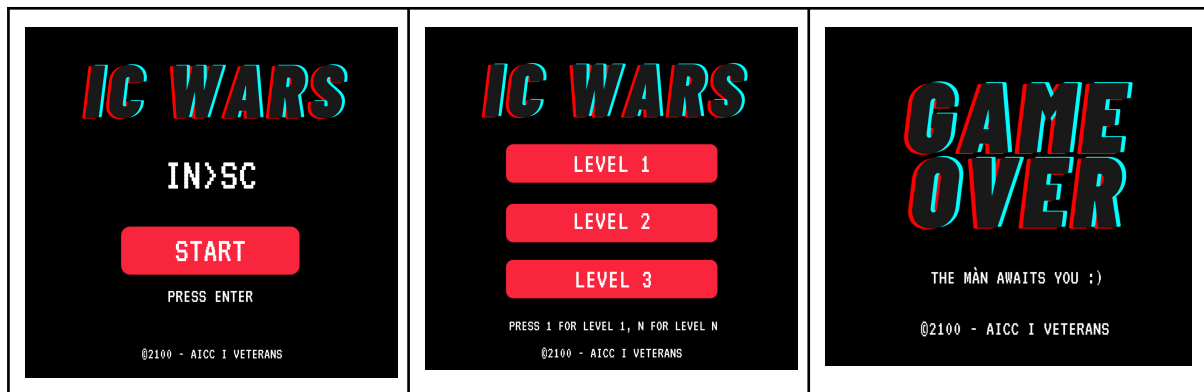


Figure 1. Basic menus for the game

Enhanced Gameplay

We have placed a great interest and effort on how the end-user will interact with the controls of the game, a reason why we have implemented different interaction visualisation techniques.

From the beginning, we have implemented a different way of showing the radius of attack of a playing unit which is now displayed using a “Manhattan distance”[1] topology, allowing more interesting attack tactics both for the physical player and for the Artificial Intelligence he is facing; this technique counts the effective cells the units needs to displace itself through in order to change its position, not its basic geometrical radius. We do also need to underline the fact that the forbidden cells like water and those occupied yet by other characters are not displayed as possible displacement targets.

In order to make the integration of the game smoother with the final user, the camera that follows the displacing units now blocks itself when exiting the game area, adding more value to the aesthetics of the game.

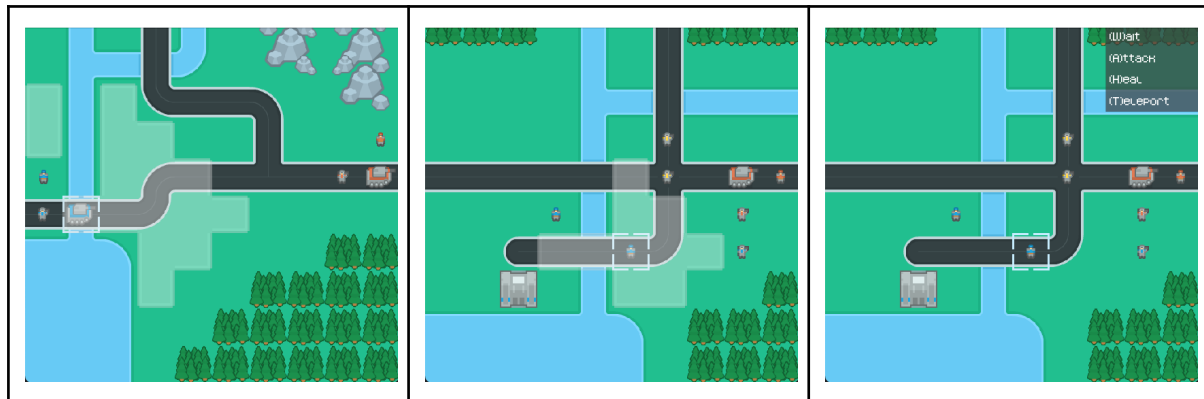


Figure 2. Enhanced game controls

Any game is always fascinating and attractive before anything because it tells a story, it is engaging the user to rethink the world regarding the immersive experience such products provide him.

To this regard, we have made a specific number of improvements. First, the tactical challenges the player needs to face are now doubled: he is now facing three enemy teams, the yellow, the orange and the green (to which we have crafted custom graphics), which are animated by a powerful artificial intelligence algorithm which goes with our enhanced game controls concept as it uses exactly the same visual interactions, in a human-perceptible time, allowing the end user to believe he could be facing a real human and not a computer, as the controls of his adversaries seem real.

Also, we do need to underline the new tactical possibilities our game offers, as showcased in the third square of figure 2 which shows the different decision a player is brought to make when practicing an attack as to wait, to attack his adversary, to use a lifesaving healing function, allowing extended game turns or simply to teleport to a randomly chosen cell the backend software generates.

In the same logic, we propose for the sake of extended gameplays, a third epic level, where your team will fight against three other armies, in a vast world of possibilities, allowing you to think of advanced attacking techniques in order to win.

An Immersive Gaming Experience

From another perspective which will remain invisible in this brief presentation, we have unlocked the power of sound effects to the ICWars game. Now, each movement of your cursor aiming to select a cell will make a particular noise, inspired from the original Advance Wars game, along with each firing of a tank or any attack; we have also integrated tens of soundtracks from the original game we got inspired from, which greatly contribute to generating a great game atmosphere.

As figure 4 shows, the new interactions between players reserve you the right to wait and think your moves, as the unit to be attacked is selectable with a simple arrow, if it is in the area of attack of your current player.



Figure 3. Extended gameplay

The Backend Design

Beneath the touch of the final user, we do also need to include some engineering facts regarding the Java code which hides behind these kinds of area games.

We have always kept in mind to work with a fully-modularised object-oriented style of programming which has allowed us to do great economies regarding the size of our software.

A standard which we have always used was a lazy evaluation of expressions, allowing quicker execution times as the result of a better global optimisation of our software.

Behind anything, a good code is always a piece of technical writing which needs to be reusable and readable by humans, not machines, a reason why we have put a great care in implementing all the methods this game uses in its way of working.

To end with, we do need to underline the great care we have paid off in detail, we have manually modified using image editors tens of textures, game foreground characters and behavior maps in order to correspond the best to a commercial strategy game where the end user can experience a high level gaming world.

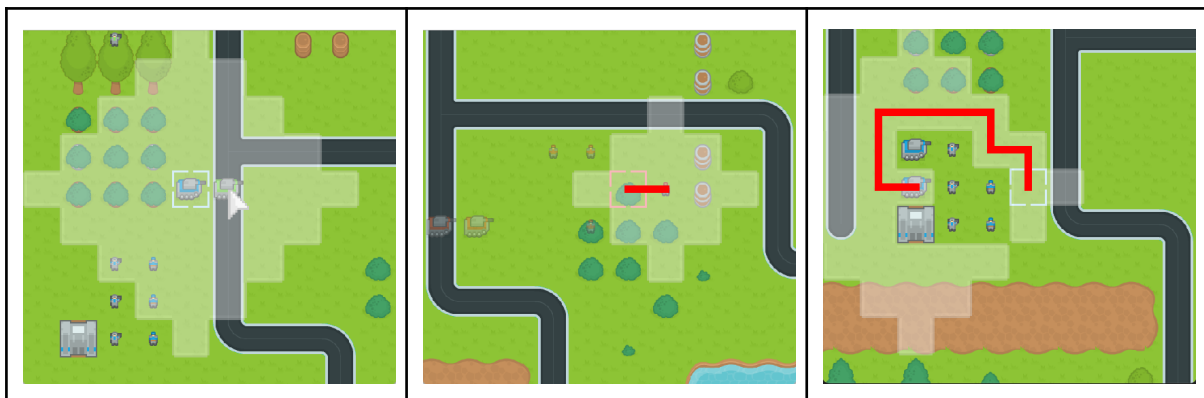


Figure 4. Advanced interactions between players

References

- [1] National Institute Of Standards And Technology, N. I. S. T. (2019, February 11). Manhattan distance. Nist.Gov. Retrieved December 12, 2021, from <https://xlinux.nist.gov/dads//HTML/manhattanDistance.html>