

# HOW DOES THE XENOMORPH IN ALIEN: ISOLATION LEARN FROM THE PAST TO CHANGE THE FUTURE?

ALEX

## INTRODUCTION

Artificial intelligence in video games has been around for a long time. In 1952, Arthur Samuel created the first AI that could play a game against a human, which was checkers. This was a whole 20 years before the game Pong was created. Artificial intelligence has since become much more advanced, and can do more than just win a game of chess or checkers. AI is now used to create virtual characters inside of video games, such as humans, animals, or monsters. These characters are known as non-playable characters (or NPCs), and they can interact with either the player or other NPCs by attacking them, talking to them, or simply looking at something of interest. AI is found in just about every game nowadays.

## ALIEN: ISOLATION

But what about Alien: Isolation? What is it about this game that has caught the attention of so many people? Well, Alien: Isolation is set on a huge spaceship called the Sevastopol Space Station. All forms of communication with other planets are lost, and on board the ship is a big, deadly, and near-invincible alien (**shown on right**). This alien, which is also known as a xenomorph, is an extremely deadly creature. It is able to kill people in one hit, run very quickly, and is invulnerable to just about every weapon, including tools, guns and small explosives. you cannot outrun it, and you cannot kill it. your only form of escape is by hiding, distracting it, or shooting it with a flamethrower. All of these methods may work well the first few times, but eventually, the Alien will learn from your tactics, and it will become much harder to survive.



Figure 1: The xenomorph in the space station.

But how have the developers managed to create such a perfect organism, and how does it even work? Well, the Alien's behaviour is actually influenced by two AIs, not one. The two AIs are known as the director AI, and the Alien's behaviour tree. The director AI knows the location of the Alien and the player at all times. When the Alien is nearby, the director will periodically give the Alien a hint of your general location, but it will never tell you exactly where you are. The Alien must find the player by itself. The Alien's behaviour tree is a big chart made up of about 100 different nodes. Two things to note about it are that there are only about 30 nodes that directly influence the Alien's action at any given time, and that not every node is unlocked at the beginning of the game. As the player progresses through the game, more of these nodes will be unlocked based on certain conditions. For example, if the player often hides in lockers to escape the Alien, it may begin to search around lockers more often. If the player always uses the flamethrower to scare the Alien off, it may begin to develop some resistance to it, reducing the flamethrower's effectiveness. This is how the xenomorph "learns".

So, you would think that based on all of that, the game must be impossible, right? How can the player be expected to complete the game if they are constantly having to hide from the Alien, and die so many times as a result? Well, the developers have taken this into consideration as well. The player can't just be scared senseless the whole time, because they would just give up. They want the player to be scared, but they don't want them to be dying so often to the point where they'll just stop playing. How have the developers managed to counter this? Well, when the Alien is close to the player, the director AI will manage the player's stress levels with a "menace gauge". The menace gauge measures how stressed a player is through the alien's proximity, if the player can hear it moving around, and if the player can directly see it. The last one is important, because the Alien could be close by, but it might be in a different room. Once the menace gauge has been high for a long time, the director sends the Alien away from the player, giving them time to make progress in the game.

However, just because the xenomorph may be hiding elsewhere in the spaceship, it doesn't mean you should start making lots of noise. If you fire a gunshot or start running, the Alien may come to you early, and this could lead to your death. It is important to remain quiet at all times, unless it's necessary to fight some other NPCs. The Alien may indeed be the biggest and most deadly threat on board the Sevastopol Space Station, but there are androids, facehuggers, and also other humans which may try to kill you. The alien doesn't really interact with the two former NPCs, but if the Alien encounters another human NPC, it will hunt them down.

## CONCLUSION

Alien: Isolation has seriously changed the way we view AI in video games. It has shown us that AI can do more than just interact with the player in simple ways, but can actually use hundreds of different behaviour nodes to influence how it will act. Despite being released in 2014, the AI in this game still intrigues people today. Even the game's own creators are sometimes surprised by what it does. Because the Alien never follows the same path twice, each game is completely different from the next. This makes it near-impossible to learn how to completely beat the Alien without dying once. Despite this, people have still done it, and this just shows that despite how intelligent the xenomorph is, the player is still more intelligent, and although extremely difficult, it is possible to beat the game without dying.



Figure 2: The player pointing a flamethrower at the Alien.