Forge ahead

At Ubisoft, the greatest minds in AI dream of a future in which videogames are smart enough to solve real-world problems.
HUMAN AFTER ALL

As AI becomes more advanced, and Ubisoft’s virtual worlds become ever more realistic, so too does the need for a more nuanced interaction between the digital and physical realms. This is where video games come in, to simulate what’s like to be human in the real world and interact with virtual characters.”

Yves Jacquier says, “We think the first three to four decades of video games were primarily about the simulation of a game world, but now we’re moving into a stage where the game world and the real world are more closely intertwined.”

And that’s where the future of video games lies. The evolution of AI has brought a new level of complexity to the gaming world, pushing the boundaries of what’s possible in terms of immersive experiences.

It goes beyond having enemies shoot guns or take cover, instead aiming to create realistic worlds.
DEALING WITH SOME SCARS OF ACRONYMS, IN TERMS OF HANDS AND SHOULDER, IT'S A HARD CALL. JACQUIER LAUGHS AS HE NOTICES HIS BOSS'S REACTION TO THE PITCH. "HE TOLD ME IN FRENCH, 'C'est sympa! It's ballsy!"

But the benefits for various aspects of the studio outweighed the costs, Jacquier argued. "When you have senior people making multiple games, maybe they want time to test a new idea. So that was a way to say, 'Even if it doesn't totally work as an acceleration factor, maybe it can help selection, to attract people and also have a corporate impact. The more we support the university, the more people we can hire, and the more people can stay here in Montreal. Instead of going to the US, it's good for the whole ecosystem.'" Curious creators from among Ubisoft's employees participate in the Montreal projects with postgrad students and scholars, bridging the gap between the academic world and the videogame industry to try to spark ideas that could have real-world applications. Imagine, for instance, AI so advanced it could create games in much the same way that a real human developer might.

The reality is closer than you might think. McGill University associate professor Derek Nowrouzezahrai demonstrates, during a remarkable UDC session, the ways in which machine learning can be used to generate realistic interactive graphics under massive time, and financial, constraints. "(La Forge) will leverage not only Ubisoft's strengths in domain knowledge, and expertise in the people we have around us, but also their ability and decades of experience generating the realistic simulation data," he explains. With years and years of data available on lightning effects, animations and physics, La Forge's talented academics can teach AI to synthesise realistic behaviour without having to force their way through actual physics. Lighting that responds to changes in scenery can be autogenerates.

A highly accurate representation of a human figure walking across uneven terrain is produced with algorithms instead of via the lengthy and expensive process of motion capture.

While the results aren't up to Ubisoft's usual high standards, just yet the studio is already making use of La Forge's latest breakthrough. Commit Assistant, Jacquier says, is the "ability to program in an AI software that can predict where bugs in developer's code will appear before they ever even become a problem. Using the latest machine learning and big data techniques, Commit Assistant combs through massive code repositories, analyzing all past bugs and regressions and assigning a unique signature to each. When a dev submits new code, it'll focus in on any matching signatures and warn of a possible bug.

It can also apply reinforced learning techniques to determine the most likely cause of the issue, and offer a fix. While it's not perfect yet -- the success rate is about 60 per cent -- the more bugs a signature's Commit Assistant learns, the more accurate it will become. If it never force changes, however, for code, it's what people check is writers. "It remains your decision," Jacquier says. "It can accelerate some parts of your job, like reviewing, and directly focus on the things that might need your attention. It leaves you more time to write on different topics that you really care about."

"The concept of La Forge emerged from trials and errors -- it did not happen overnight.

The idea is not simply to replace gameplay with algorithms, but to free up their time -- around 20 per cent of it. Jacquier estimates -- for less tedious parts of the job. "Different production teams will decide what to do with this extra time," Jacquier says. "Do they want to add more depth to the gameplay? Do they want to expand some features? I don't know. They will have to answer this question.

There's a stunning theme to most UDC talks: developers' virtues of automated processes in helping prevent burnout. The robots, Ubisoft says, aren't out to destroy us and take our jobs; in an age where teams are under more pressure than ever to keep creating new content for their games, responsible corporate applications of AI could be a humanitarian solution. "We're trying to empower developers to spend less time on the boring parts of the job, and let them decide what has real added value. "I think they are going to surprise us. We want them to surprise us. Everything that we're doing in terms of AI as tools to facilitate work is really ready to provide our creators with more time to surprise us, instead of having to work on repetitive tasks." If all goes to plan, we expect to see fewer towers from Ubisoft in the future.