

WOULD YOU LIKE TO MAKE A GAME?

ARTIFICIAL INTELLIGENCE, MEET
BEDROOM CODERS. BEDROOM
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Gaming bots get a hard time of it these days. With multiplayer gaming now easier to arrange than a group falling-off-of-a-log session, more satisfying opponents are available all day, every day. The experience of playing against another living, breathing human being is one that can't be easily matched by circuits and logic.

Yet the pursuit of challenging, rewarding AI opponents is an academic quest in no danger of dying. Not least because gaming is still in great demand of intelligence – even the most human-centric MMOs need opponent AI, and a lot of the behind-the-scenes technology in modern gaming is based off some form of artificial reasoning – but also because it rewards the researchers with real progress in their pursuit of knowledge.

Imperial has already given much to the gaming industry by

being the crucible in which Introversion Software was formed, but now it may be giving an entirely new gift to games development. Dr. Simon Colton in the Department of Computing and his Masters-student-turned-PhD Robin Baumgarten have jointly released an API for creating artificial DEFCON agents, in a joint project with DEFCON developers Introversion.

I spoke to Robin and Simon about their work before Christmas, and they were both very enthusiastic about

what they'd achieved. Not only had they applied their own research into adaptive AI and beaten the standard DEFCON bot, but they'd developed an API that others could use to make their own intelligent creations.

The API is a collection of useful code snippets that developers can use to access important features in the DEFCON game without hacking the game itself. It allows bot creators to ask for information about the game world, send chat messages, and

“ANYONE CAN START FOOLING AROUND WITH NUCLEAR WEAPONS”

make moves on the map – as well as opening up some shortcuts for useful bot functionality. Best of all, it's free to anyone who'd care to take a look, which means anyone can download the kit and start fooling around with nuclear weapons.

And the hope is that people will do exactly that. Robin and Simon are hoping that the API will become widespread enough to hold contests between the bots, as

is popular in AI circles. Because of its restricted ruleset and simple concept, DEFCON is a good choice not only for the bots themselves but also for those that design with them.

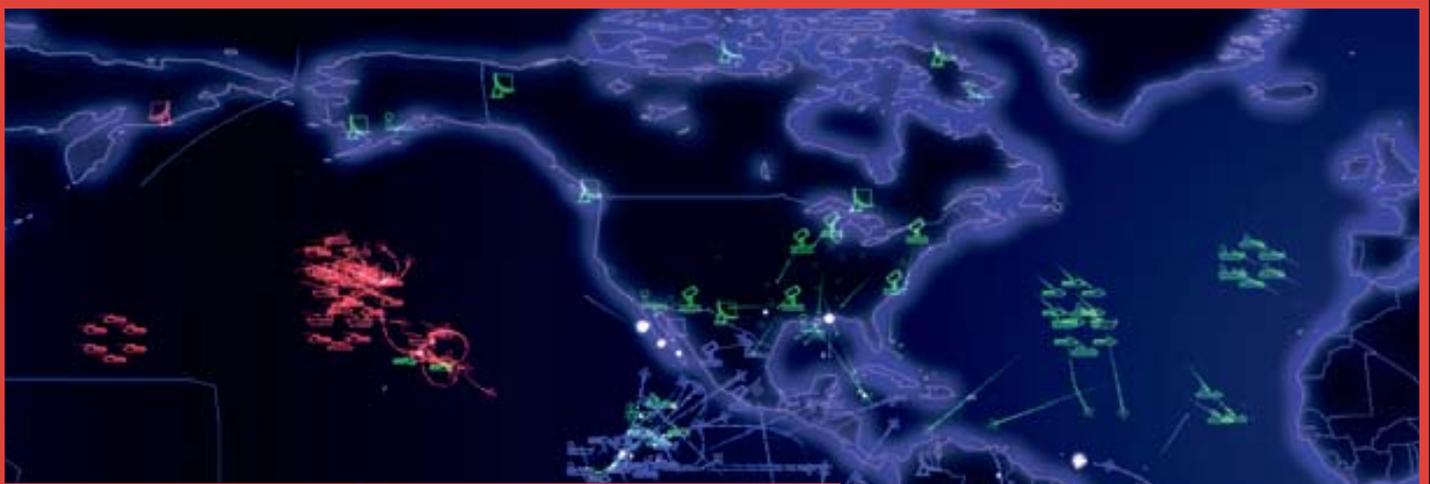
Robin and Simon used a mix of AI techniques to design their bot, who kept a database of past games

and compared the current opening strategy with those it had seen in the past. But DEFCON is an untapped mine for tactics and strategies, and could well become another testbed for AI techniques, in the same way many boardgames have been in the past.

The Bot section of the Introversion website begins, “It's no secret that DEFCON was inspired by the movie Wargames” and goes on to discuss the game's central character – the AI controlling the US nuclear arsenal.

So where might you start? Well, we cover the most general stuff here (see “Basics” for an overview) but it's quite an open problem, and you really need to have a desire to see this thing through before you start it. The nature of the API is exciting in itself, though, as it makes AI coding friendlier to those who might be interested, and that means a more thriving community.

A thriving community benefits the gamers above all else, as the standard of technology increases with all the additional attention and effort. Robin is now working with games on other projects, applying his knowledge of AI techniques to other problems related to game design,



The DEFCON API is available for free. Get coding, then get fighting

with research funding for major projects with well-known games developers. Successes lead to more opportunities, and overall this means an improved experience. But they're clear on where the research has to stop, and ultimately their work has to lead to some sort of scientific output. Robin and Simon are academics, working in research, and as such they can't allow themselves to become 'contractors', as Dr. Colton puts it. At some point they have to stop back, present their findings, and move onto the next work. Which is why presenting an API tool to an enthusiastic community is so invaluable.

So, the main question remaining is how usable this thing really is. The truth is that it's not like sitting down and teaching a human being how to play noughts and crosses. And the interface isn't just a simple case of typing 'PLAN TO KILL EVERYONE; EXECUTE PLAN;'

But it's still a great tool for those with persistence, or just a fascination with the way this game stuff might work. If this community were ever to gain momentum, merely downloading other writers' source code and looking at it would be a fascinating exercise.

The fact is the AI in gaming is not fantastic. Robin, a gamer himself, says that there is so much ground yet to cover, merely to get to where the cutting edge is today. "Recently I played Halo 3, and the A.I. is still so stupid. The friendly A.I. is driving around and crashing into you."

What should be most interesting, from the point of view of a gamer, is

that both Robin and Simon appreciate that a winning bot is not always the best solution to the problem. While an API like this opens up the opportunity for competitions, it's important to remember that very few players want to be beaten every time they play.

"In chess, you want to achieve checkmate, it's really objective and you can formulate it quite easily in logical rules," Robin explained to me. "Whereas in videogames most of the time you want to enjoy, or from a developer's point of view, you want to get more sales. And you only get more sales if people enjoy the game."

From my point of view, DEFCON became frustrating because it was unclear what I was doing wrong when I lost. A combination of poor reflexes and inexact forward planning meant that I often left a game feeling I'd been unfairly beaten. While I'm not suggesting that every gamer experienced DEFCON the same way – or indeed, that every gamer is as terrible at strategy games as I am – it's important to remember that this API does not entirely represent a perfect future for intelligence in gaming. Ironically, we may have to wait for people like Robin and Simon to do further work before we understand what it is that makes a truly good artificial opponent.

Until then, however, I'm sure many of you will be content to tinker and play. So get out there, download, and start coding. And if you get any phone calls from NATO, just tell them no and leave the country.

BASICS

WHAT IS THIS?

It's the release of an API (Application Programming Interface) that allows budding games designers to get their hands on the insides of the strategy hit DEFCON and start designing an AI 'bot' to play games against humans and other bots. The API is designed for fledgling AI programmers and bedroom coders who want to work with a more interesting test area than endless games of checkers – playing DEFCON against one or more opponents.

WHAT SHOULD I KNOW?

The bots are coded in C++. It's probably not a good idea if you've never programmed before, but if you've tinkered in any mainstream programming language then you might have a chance of making sense of it, as the API is largely well-designed and the interface itself is simple enough to understand.

WHAT DOES IT COST?

Nothing! Both the API and DEFCON are available for free from www.introversion.com/bots. A paid-for upgrade is available to unlock all of DEFCON's game modes, but the demo gives you everything you need to play against bots.

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