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Computers That Crush Humans at Games Might Have Met Their Match: 'StarCraft'

Artificial intelligence has conquered complex games, but to win this one, machines need to figure out how to lie

By **JONATHAN CHENG**

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SEOUL—Humanity has fallen to artificial intelligence in checkers, chess, and, last month, Go, the complex ancient Chinese board game.

But some of the world's biggest nerds are confident that machines will meet their Waterloo on the pixelated battlefields of the computer strategy game StarCraft.

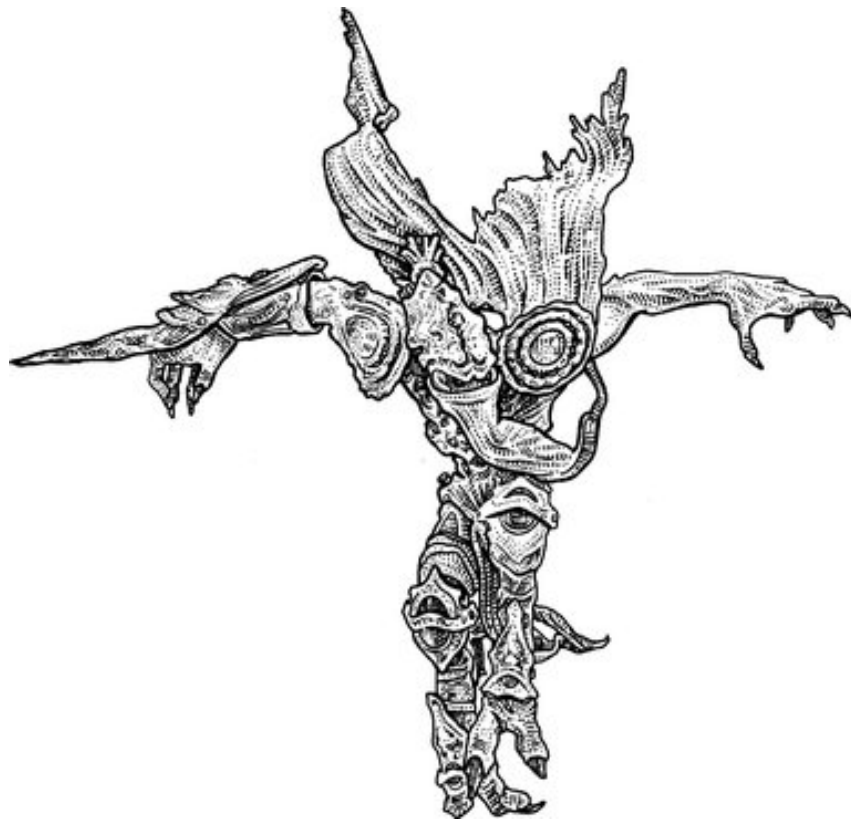
A key reason: Unlike machines, humans are good at lying.

StarCraft, created in 1998, is one of the world's most popular computer game franchises. It pits three races against one another: the humanlike Terrans, the slimy insectoid Zerg and a mystical race with psionic powers called the Protoss.

Players pick a race and then use its units—spacecraft with cloaking abilities or little creatures that can burrow in the soil, for example—to exterminate their opponents and capture their headquarters. Unlike chess or Go, players don't take turns making their moves. Everything happens at once.

The intricacies of the game and the endless permutations of possible strategies have made StarCraft, in the minds of many artificial intelligence experts, the obvious next target for man-machine contests.

Demis Hassabis, creator of the artificial-intelligence program that defeated Go



Dark Templar

grandmaster Lee Se-dol in the recent closely watched match in Seoul, has long eyed StarCraft as a possible challenge for his AI company DeepMind, which Alphabet Inc.'s Google acquired two years ago.

In 2011, Mr. Hassabis called StarCraft "the next step up" from abstract games like Go, and last month named it as a potential next target for his AI researchers, which include a former pro StarCraft gamer.

Michael Morhaime, co-founder and president of StarCraft creator Blizzard Entertainment,

says he has reached out to Google after the man-machine Go match, but Google says it is still weighing a number of possible platforms for its AI tests.

"We would love to be a milestone on that advance of artificial intelligence, from chess to Go and then us," Mr. Morhaime said.

Facebook Inc. and Microsoft Corp. also have employees working on StarCraft AI projects, but both companies say they are currently small-scale ventures. Microsoft says it is also working on using AI to crack the videogame Minecraft and a variation of Texas Hold 'em Poker. Facebook is working on a Go AI program.

In addition to its complexity, the most appealing aspect of StarCraft for AI developers is the element of uncertainty: Unlike games like chess and Go where both players can see the entire board at once, StarCraft players can't. Players must send out units to explore the map and locate their opponent.

The lack of visibility means that computers can't simply calculate all the possible moves their opponent might make, and elevates bluffing as a key strategy employed by the world's top StarCraft pros.

An advanced human player might, for example, feign weakness on one side of the



Fans watch a StarCraft tournament in Seoul in September. Videogame competitions, known as e-Sports, are popular in South Korea. *PHOTO: SEONGJOON CHO/BLOOMBERG NEWS*

playing field while mustering a pack of mutalisks—fire-breathing dragon-like creatures—on the other side of the board.

“Giving false information or false cues is a very advanced strategy, so it would be amazing to see a computer try to do that,” says Mr. Morhaime, the Blizzard co-founder.

Eugene Kim, a 22-year-old professional StarCraft gamer in South Korea considered the world’s top human player, says bluffing is a critical skill to succeed at the top levels of the game.

Mr. Kim is skeptical that AI is anywhere near challenging mankind. “In order for a computer to win, it needs to learn how to lie,” he says.

Cho Man-soo, secretary-general of the Korea e-Sports Association, describes StarCraft as “all about bluffing.”

“It’s going to be hard for AI to bluff or to trick a human player,” he says.

Some believe machines will eventually prevail, once they are programmed to figure out their version of lying.

What humans call bluffing, the computer simply considers another possible strategy among many, says University of Alberta computer scientist David Churchill.

“When the AI finds that the only way to win is to show strength, it will do that,” Mr. Churchill says. “If you want to call that bluffing, then the AI is capable of bluffing, but

there's no machismo behind it.”

Mr. Churchill has been running an annual StarCraft AI challenge for the past five years. The competition pits AI programs developed by different teams of Ph.D.s against one another to sharpen their skills, before taking on top-ranked human players.

So far, it hasn't even been close. As it turns out, the AI isn't quite as good as humans at executing time-tested maneuvers like the mutalisk rush (dispatching a flock of the flying dragon-like creatures at enemy headquarters) or dark templar drops (using a flying shuttle to deposit a cloaked warp-blade-armed warrior near enemy worker drones).

Other AI developers are still far from the point where their programs might be able to trick a human opponent. For now, some programmers are still trying to work out more basic kinks, like one in which units appear to dance back and forth on the map as the algorithm struggles to stick to one coherent strategy.

Few know StarCraft as deeply as South Koreans, where the game has been dubbed the national sport because of its popularity. StarCraft and other competitive computer games have been recognized as sports by the country's national Olympic committee.

Young pro gamers are feted like rock stars, with devoted fanbases and endorsement deals. Cable-TV channels broadcast games between top-ranked StarCraft masters, while tournaments can fill arenas with screaming fans and live commentators.



A member of a professional videogame team plays StarCraft during a daily practice session at a training center in Seoul.
PHOTO: SEONGJOON CHO/BLOOMBERG NEWS

Using a mouse and keyboard, the world's top players can issue 500 or more commands a

minute. In last year's global StarCraft tournament, held in Anaheim, Calif., 15 of the 16 finalists were from South Korea.

But the humans' reign at StarCraft is threatened by the machines, Mr. Churchill says.

“In the past we have seen the human world champions of checkers, chess, and Go say that they will not be defeated by computers, and each time they were wrong,” he says. “It would be foolish to assume that StarCraft, even though it is a much more complex game, is any different.”

—*Min Sun Lee contributed to this article.*

Write to Jonathan Cheng at jonathan.cheng@wsj.com

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