from BEES to BEZOS

HOW DO YOU PROTECT HUMANKIND FROM THE RISE OF THE ROBOTS? THROUGH THE 'SWARM', A POSITIVE FORM OF GROUPTHINK.

WORDS • STEPHEN CORBY

f your concerns about the future of AI, and the idea of computers becoming simultaneously self-aware and smarter than us, are based on *The Terminator* films, that just makes you fairly typical, and perhaps slightly gullible.

But when you speak to someone who works in AI every single day – as Professor Louis Rosenberg does – and he says he's genuinely worried about 'the singularity', as dystopian types call it, you do get a Skynet-style chill of dread run down your spine.

Rosenberg, 46, CEO of a company called Unanimous AI, which uses a mix of self-learning algorithms and human intuition to predict the future, fixes me with a stare of icy certainty when I ask him whether he thinks humans will develop a form of AI with the potential to wipe us out.

"WILL WE BUILD A MACHINE THAT CAN DO IT, A GENERAL AI THAT BECOMES SELF-AWARE? YES, AND AS SOMEONE WHO WORKS IN AI THAT'S REALLY, REALLY SCARY. I LIKE TO COMPARE THAT TO THE IDEA OF AN ALIEN ARRIVING FROM OUTER SPACE, BECAUSE AN AI IS JUST AS ALIEN; IT'S A FOREIGN INTELLIGENCE."

"Now if an alien shows up, it will have its own morals, its own values, its own interests, and we have no reason to believe that these things will be aligned with our own. We can hope that they are, but the history of humanity shows that when two different intelligences meet, one tends to dominate the other.

"But artificial intelligence would be even worse than an alien in a way, because it will already have access to all our systems; we've already given it access to our financial systems, our power grids, so we've invited this alien entity to take control of

our infrastructure, and then we're just hoping that it is friendly. To me, that's extremely dangerous."

It also makes writer/director James Cameron sound a bit like Nostradamus, which is also scary.

The professor is far from the only one with these concerns, with uber-nerds Bill Gates and Elon Musk warning of the dangers of giving computers superhuman abilities.

What makes Rosenberg remarkable is that he has a unique plan for combating the coming technocalypse – using AI to join humans together into super-intelligent swarms.

"Yes, we should put rules and regulations in place to control AI, but we can't rely on that; humans have a pretty poor history of containing dangerous technologies," Rosenberg chuckles ruefully. "But if we know that an AI will emerge that is smarter than us, one approach we can take is to make ourselves smarter, by bringing groups of humans together to become our own super intelligence.

"We've found that when we use technology to connect people online so that they can think together as a system, they become significantly smarter together. I would say we, as a species, are on a path to forming ever smarter groups. It could be the reason we've put thousands of satellites in the air and a receiver in the pocket of most people on Earth."

⬡ THE SWARM

If you think this sounds like science-fiction in the style of *The Terminator* franchise, think again. Earlier this year, Unanimous AI collected a group of 50 movie fans – not professional or self-appointed film critics, just punters – from around the US and asked them to predict the outcome of every single award in the 2018 Oscars.

As individuals, their answers were a reasonable 60 per cent accurate. But shortly before the Academy Awards were held, Rosenberg and his team hooked those 50 people up remotely, using real-time feedback loops, and their own AI software, and formed what he likes to call a "hive mind", or a swarm.

"THOSE SAME, EXACT PEOPLE, ACTING AS A SWARM, WERE 94 PER CENT ACCURATE, WHICH MEANT THEY PERFORMED BETTER THAN THE EXPERTS FROM *THE NEW YORK TIMES*, *VARIETY* AND THE *LOS ANGELES TIMES*. WE WERE BLOWN AWAY BY THAT RESULT."

"Later, we went back to those people and asked them how many of them had actually seen all the movies nominated, and none of them had; most of them hadn't even seen half of the movies, but what they were doing, thinking as a group, was filling in the gaps in each other's knowledge."

If you think this kind of predictive accuracy might be handy for something slightly nefarious, yet highly profitable, like gambling or sports betting, the folks at Unanimous AI are way ahead of you.

In 2017, a swarm they formed correctly predicted the superfecta in the Kentucky Derby, so this year, the organisers of the race asked Unanimous AI to help them perfect the handicapping of the field.

Two years ago, *The Boston Globe* challenged Rosenberg and his cohort to predict the outcome of baseball's World Series, and to do so at the midpoint of the season.

"They gave us a group of 50 of their readers and asked us to predict who would be in the play-offs, and who was going to win the 2016 World Series. That group of fans correctly predicted all eight teams to make the play-offs, that the Chicago Cubs would face the Cleveland Indians, and that the Cubs would win, which was a highly unexpected result as the Cubs had not triumphed since 1908. The only thing the swarm got wrong was that they predicted the Cubs would take five games to win, and they actually took six," Rosenberg recalls, beaming.

"THERE'S AN AMAZING INTELLIGENCE OUT THERE IN THE POPULATION. PEOPLE ARE SMART BUT THEY ALSO HAVE INTUITION, THEY HAVE GUT INSTINCTS AND IF WE AMPLIFY THEIR INTUITION, THEIR INSTINCTS AND THEIR KNOWLEDGE, YOU CAN CREATE THIS SUPER-EXPERT THAT JUST AMAZES US."

So, how does it work? It's all about the bytes and the bees, basically. Rosenberg explains that »

he started out by looking at natural systems, which have evolved over millions of years to amplify the intelligence of large populations.

Bees, in particular, have been studied in detail and scientists have noted how they work as a super-organism, which piqued Rosenberg's interest.

"Our algorithms are based mostly on bee swarms, which can make remarkably accurate decisions about where to find new homes, where to find pollen – they send out hundreds of scout bees, and each of those bees will search eight square metres," the professor explains.

"Each scout team has knowledge of a certain patch, and they come together as a swarm and figure out the best possible site by combining their limited knowledge in an efficient way (using a technique known as the 'waggle dance').

"And bees have tiny brains, smaller than a grain of sand, yet the decisions they make together would be hard for a human to do.

> **"SO IF A GROUP OF BEES CAN AMPLIFY THEIR INTELLIGENCE TO THE LEVEL OF A HUMAN, A GROUP OF HUMANS SHOULD BE ABLE TO AMPLIFY THEIR INTELLIGENCE TO A MUCH HIGHER LEVEL. WHICH IS HOW A BUNCH OF MOVIE FANS BEAT THE EXPERTS. AS A SWARM, THEY CREATED A SUPER-EXPERT, A SUPER INTELLIGENCE."**

AS SMART AS AI

This does make you wonder, of course, how smart an AI swarm could be if you populated it with the brightest minds – the Musks, Gates and Obamas – and Rosenberg says that's something he's very keen to try as well.

"We've started a project with Stanford Medical School where we're creating swarms of radiologists, with the idea being that while a single radiologist can look at an X-ray and make a certain diagnosis, there are certain types of diagnoses that have very high false-positive rates. So if we build a swarm of five radiologists working together we could significantly reduce the error rate," he says.

Political polling is another area where this form of AI can be hugely effective, and Rosenberg did run swarms during the Trump vs Clinton presidential election campaign – "We were thinking maybe our algorithms were broken, because the answers we were getting were so different from the polls; everyone was swinging towards Trump."

Corporations have also been hiring Unanimous AI for various projects, like forming swarms to watch TV spots and decide which ones are the most effective, or asking a hive mind of movie fans to predict box-office results, based on watching trailers.

Obviously, Rosenberg expects to profit from his astonishing and ever-expanding tool, but he also believes it is a way of safeguarding our future against some malignant form of AI.

"In some sense, what we're doing is the lesser of the two evils," he says. "We can't stop the future from moving forward, so Unanimous AI is interested in keeping people relevant, keeping humans as a part of the AI system, as opposed to AIs becoming a species of their own." ∎