OLIVER BERG/AFP/GETTY IMAGES

Now it's personal

Games that know you

Video games mine data shared on social media to personalise each player's experience

Jacob Aron

"WHEN I put my son to bed, I quite often tell him a story," says Peter Molyneux, a British game developer who recently left Microsoft to start his own studio, 22Cans. "I will have crafted that story around what I know about him, what he has done in the past few days. Those are the best stories I can tell him – better than Harry Potter, better than anything else because they pull his life into the story." Molyneux, who has worked in the industry for 30 years, wants to create an artificial intelligence that can offer players the same tailored experience in his next game.

Game developers have traditionally attempted to create AI systems that model realistic human behaviour and emotions, but Molyneux says this is too difficult with current technology. "Human beings can read emotion in faces down to a level of fidelity we can't even dream of in games at the moment," he says. Instead, he plans to harness the wealth of personal data shared on social media to learn what players enjoy and create characters that connect with them as individuals.

It's a lofty goal. How do you turn social media information into a game? Michael Cook, a computer scientist at Imperial College London, is using social media to teach games about the real world. He has created an AI system that designs its own simple video games and recently added the ability to base these games on news articles using personal opinions gathered from Twitter users. Cook says the system has a good opinion of Rupert Murdoch at the moment. "I'm not sure whether that's a bug or not," he says.

In a few weeks' time, Molyneux will launch the first of 22 experiments designed to explore the psychology of social-media users. The results of these experiments will inform the final design for a game he plans to release in two years' time.

The first experiment, "Curiosity", puts players in a virtual room containing a single black cube. Players tap away at the cube, causing it to fracture and shed tiny layers from the surface. Other fractures also appear because everyone playing the game is tapping away at the same black cube.

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After an undivulged, large number of taps, the cube will open, revealing something "truly amazing, absolutely unique", says Molyneux. The twist is that only the player who performs the final tap will get to see inside the cube, and 22Cans will study how news of the revelation spreads. "We will rely entirely on social media," explains Molyneux. "How will this person prove it? That in itself becomes a fascinating aspect of this experiment."

Before the cube opens, a second phase of the experiment will be launched. Players will then be able to purchase one of a limited number of chisels to amplify their tapping strength. These range from a iron chisel, costing 59 pence, that is 10 times more powerful than just tapping alone, to a diamond chisel that is 100,000 times as powerful. Again, there is a twist: Molyneux will only sell one diamond chisel – and it will cost £50,000. "It's an insane amount of money," he admits, but the aim is to see whether pure curiosity will drive one player, or a syndicate of players assembled through social media, to buy the chisel. "This is not a money-making exercise; it is a test about the psychology of monetisation."

Other experiments that use social-media data more directly ›

When the player gets played

Blurring player's lives with games has been tried before. Players of *Majestic*, an ahead-of-its-time conspiracy game, received puzzles via real-world phone calls, instant messages and faxes. British game designer Peter Molyneux's *Black & White* scanned players' computers to identify their name and if it was one of the 200 most common ones, then whispered a creepy recording.

Another of Molyneux's projects, *Milo & Kate*, saw players interact with a startlingly lifelike child. Each day a few new lines of dialogue were added referencing real-world events. "It was 90 per cent trickery, but people wanted to believe that he was real," he says.

« will follow, but how will they help build an AI that treats you as an individual? Molyneux says the key is to identify small changes that provoke a strong reaction among players (see "When the player gets played", page 21).

Demis Hassabis, who worked with Molyneux in the 1990s and is now a neuroscientist at University College London, takes a different approach to personalisation. He is advising a start-up company that is working on an AI designed to give players unique experiences by reacting to the choices they make during the game.

"We're creating agents that can learn how to play games, rather than being programmed how to play them," he says. "It will learn from the human players' interactions."

Hassabis also hopes that gaming AI could help improve machine intelligence in general: "Games are good testing environments – they are not too simple, nor are they as complex as the real world."

"The game will reflect your mood - tweet about having a bad day and it will become more sombre"

Cook suggests that Molyneux's completed game may reflect your current social-media mood – tweet about having a bad day and the game could become more sombre. "It is going to be inspired by events that have happened to you, but it may not represent them in a literal sense," he says.

But what if you don't want your personal information to bleed into a game? Molyneux says that although it is currently easy for apps to access personal information, that is likely to change in the future as people realise the potential dangers of oversharing.

"Saying, 'Let me look at your Twitter feed', is not enough – I've got to make people want to give it up." He hopes his experiments will convince players to do so. ■

A lost pilgrim found

Face recognition software could help identify pilgrims on the Hajj who have gone missing or died in Mecca

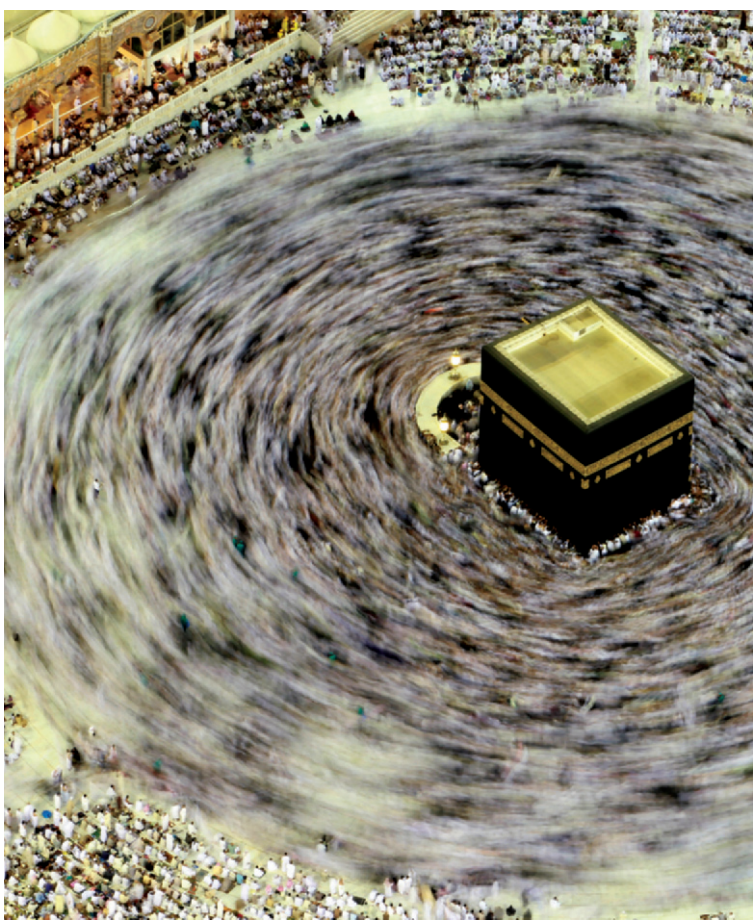
Hal Hodson

EVERY year, millions of pilgrims flood to Mecca in Saudi Arabia to perform the fifth pillar of Islam – the Hajj. Sadly, some go missing or die amid the faithful throngs, and in a gathering of such size, finding or identifying those people is difficult.

It might be about to get easier, thanks to a face recognition system being developed at Umm Al-Qura University in Mecca. Using photographs taken of every pilgrim that enters the country, the system will help the authorities scour CCTV images for the faces of the missing, or help them identify the deceased.

The system is part of a broader project called Crowdsensing – funded by Saudi research institute HajjCORE – which aims to predict and manage the flow of pilgrims using a network of 1500 CCTV cameras in and around Mecca's Grand Mosque (Masjid al-Haram). The large crowds have led to several disasters in recent years, including a stampede that killed 362 pilgrims in 2006.

The face-recognition software



REUTERS/HASSAN ALI

Why using the hive mind is nearly always best

CROWDSOURCING is now big business. But is asking the crowd for answers better than just asking one relatively intelligent person? And if you go to the crowd to hire online workers, how can you be sure they will be any good? The first way to objectively measure crowd cleverness might help.

Thore Graepel and colleagues at Microsoft Research in Cambridge, UK, looked at IQ tests taken by 138 people, then fed their answers into a machine-learning algorithm. The algorithm then did its own IQ test based partly on their responses, but also taking into account how difficult each problem might be and what answers each individual gave compared with the others throughout the test. From this, it could calculate the probability that each person answered correctly and so whether it should use that answer.

The researchers found that the machine's score, which they call the crowd IQ, was significantly higher than the average IQ of the general population, so long as there were enough people involved.

The test also allowed Graepel to investigate the effect of incentives. "A lot of crowdsourcing tasks require intelligence, and we use the IQ test to figure out how parameters like payments change things," he says.

Graepel used the algorithm to analyse the performance of 175 workers crowdsourced through Amazon's Mechanical Turk service,