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What if there was a little cat who was afraid of mice?

A new European project is exploring computational creativity. It is working to engineer software that can take on some of the creative responsibility in arts and science projects.

Speed read

- A three-year European project has created 'the What-If Machine'.
- The What-If Machine runs on a 128-core Linux machine and is accessed via a web portal. It can come up with a range of hypothetical scenarios to form the basis of a Disney movie, a musical, or other fiction-based work of art.
- The machine has been created to help researchers explore the possibilities of computational creativity.
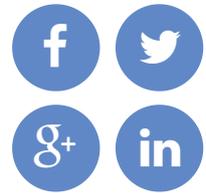
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Yes, that's right, a cat that's afraid of mice. How's that for the premise of a new Disney animated movie? Quirky, no? Surely the kids will love it...

"Here, the What-If Machine has taken the concept that cats eat mice and has inverted it," explains Colton. Llano also highlighted some of the project team's favorite ideas generated by the What-If Machine. These include 'What if there was an old dog, who couldn't run anymore, which he used to do for fun, so decided instead to ride a horse?' and 'What if there was a lift with a million buttons? It could rise as high as heaven.' Image courtesy Schmid-Reportagen, Pixabay (CC0 Public Domain).

What's that you say? You hate the idea... oh well, it wasn't me who came up with it anyway — it was a computer. In fact, this is actually just one of many movie ideas spat out by the 'What-If Machine', a software system capable of inventing and evaluating fictional ideas.

Contrary to the evidence of the latest *Fantastic Four* movie, this machine isn't actually sitting in the cavernous basement of some Hollywood studio, churning out formulaic ideas designed to induce the largest possible number of people to part with their hard-earned cash to sit in a sticky, dark cinema for a couple of hours. No, instead it was designed by a team of computational scientists in Europe to explore whether computers have the

Tags

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capacity to be creative. Can computers come up with fictional ideas with real cultural value?

Funded by the European Commission, the three-year 'WHIM' project is working to engineer software that can take on some of the creative responsibility in arts and science projects. The What-If Machine, which runs on a 128-core Linux machine accessed via a web portal, can come up with a range of hypothetical scenarios to form the basis of a Disney movie, a musical, or other fiction-based work of art.

To do this, the system first collects and analyzes information from the ConceptNet semantic network about a particular domain, so as to form a shallow world view of this area. Then, using flow-charting software, it generates a set of what-if style ideas from the analysis using notions of surprise, semantic tension, and incongruity. Information is also analyzed from the DISCO database, which tells the What-If Machine how frequently words appear together; the Stanford CoreNLP package, which is used to check the grammatical structure of the generated ideas; and a range of other tools.

The ideas generated are subsequently assessed and ranked based on the quality and quantity of narratives that can be generated using each, with a range of other factors being taken into account as well.

Humans are also invited to rate the ideas generated by the What-If Machine, with the system then able to use this information to learn and predict ideas

that are more likely to be popular. "Our work so far has shown that there is some consistency between what people like, so we're trying to use machine learning to make the What-If Machine capable of predicting which scenarios generated will be rated more highly by humans," says Simon Colton, project coordinator and professor in computational creativity at Goldsmiths College, University of London. "This process of generating scenarios is known as 'ideation': it can provide 'the seed' for stories. We want people to be able to use the What-If Machine to overcome their writers' block."

Of course, the ideas generated by the What-If machine aren't just intended for use in literature or film; Colton and his colleagues hope they can be used in a wide range of creative endeavors. "Systems like the What-If Machine can actually help people who want to create cultural artefacts themselves but don't know where to start," says Maria Teresa Llano Rodriguez, a research associate within the computational creativity group lead by Colton. "We hope these systems can be used as teaching resources or to inspire and collaborate with people at all levels of expertise."

"Computer systems are mostly seen as tools," says Llano. "However, the purpose of computational creativity research is to build software systems that can collaborate with people in the creative process, as well communicate with users in interactive systems, such as video games."

In addition to his affiliation at Goldmiths, Colton also holds a position of European Research Area

(ERA) chair at Falmouth University, UK. He and Llano believe that the What-If Machine could be used to feed into the gaming-related work of their colleague Michael Cook. As well as his role as a researcher at Goldsmiths, Cook is also a PhD student within the computational creativity group at Imperial College London. He is working to develop an AI system that can intelligently design video games.

Another idea of Colton's is to plug the What-If Machine into his 'Painting Fool' computer program, which creates original artworks using artificial intelligence, machine vision, and computer graphics techniques. He hopes the What-If Machine could come up with ideas that the 'Painting Fool' could then paint.

"Our big philosophical contribution is to help improve understanding of what fiction really is," explains Colton, who is collaborating with researchers from the University of Cambridge, University College Dublin, Jozef Stefan Institute in Ljubljana, and Complutense University of Madrid on the project. "The What-If machine is an antidote to boring old AI, which is all about reality," says Colton. "There's a lot of potential for idea generators like the What-If Machine to affect the creative industries: Automation of intelligent, creative tasks has the power to free us — it would be a wonderful thing."

 "Creativity is a major driving force of our society, yet there's just not enough creativity in the world," concludes Colton. "Creativity is expensive, but

creative software could make it accessible to everyone. When computers become truly creative, I believe it will have an 'Ikea effect' that will reduce the price we put on creativity and enable everyone to have their own, original works of art."

You too can help support Colton and his colleagues with this research, by playing with the What-If Machine online here. Let us know what results you get on our Twitter and Facebook pages using the hashtag #WhatIf.

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