

University of Toronto team delivers computer-generated Christmas song

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(Tech Xplore)—"The Christmas tree is filled with flowers. I swear it is Christmas Eve. I hope that is what you say."

These are lyrics to a holiday song. I know. You're thinking it's a boy band totally drunk. You assume they are trying to revive a rock band vibe until they fall on their foreheads and their manager rings for a designated driver.

However. The song did not come from a human. *The Guardian's* Ian Sample, science editor, explained what happened in simple terms.

"Scientists fed a Christmassy photograph into a computer and let it do its thing." Sample said the creators call it "neural karaoke." [It was a picture of a Christmas tree and presents.]

The program sang the lyrics to music that it composed along the way. The project is at the University of Toronto. Katyanna Quach in *The Register* wrote about what inspired the team to move on this.

"Hang Chu (a PhD student) and Raquel Urtasan and Sanja Fidler (both associate professors) all [work](#) at the University of Toronto as researchers in computer vision, but became intrigued to see if the underlying principles of good pop music could be captured in algorithms."

Musical Instrument Professional said "The [result](#) is odd to say the least. If you're a fan of Japanese humanoid singing synthesiser Hatsune Miku you'll probably like it. If you're not – well, you'll probably have nightmares tonight."

After all, this is regarding machines here, not Jimi Hendrix. For machines, this is an analytical exercise. "They don't understand music, but they can do maths," said Quach in *The Register*. "By feeding the [neural network](#) a particular scale, it gives the system a series of notes it can choose from to make a melody."

Sample described how they did this: A lab student trained a neural network on 100 hours of online music. Once trained, "the program can take a musical scale and melodic profile and produce a simple 120-beats-per-minute melody. It then adds chords and drums."

Sure, it sounds like robotic karaoke but the point is that, think about it, a digital photo can be transformed into a singalong generated by a computer.

Are we that far off from a day where you show a photo of you and that cat of yours and the program returns the favor with a song about you and the pet? Sample quoted Raquel Urtasun, an associate professor in computer science and research chair in machine learning and computer vision at [Toronto's computer](#) science lab. "We are used to thinking about AI for robotics and things like that. The question now is what can AI do for us?"

The University of Toronto team effort is but one example of interest among AI researchers choosing to explore computers and music-making.

In September this year it was announced that "At SONY CSL Research Laboratory, we have created two entire pop songs composed with Artificial Intelligence, thanks to Flow Machines. How is it [possible](#)? That's because our Flow Machines software learns music styles from a huge database of songs. Then, exploiting unique combinations of style transfer, optimization and interaction techniques, it can compose in any style."

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