

Embedded tech allows robot to move itself, has own rhythm

2 August 2016, by Nancy Owano



Alter is a new type of robot. A video of the robot is posted via *The Japan Times*. One viewer commented that it was the creepiest thing the viewer had ever seen.

The Alter went on display at Odaiba's Miraikan museum on July 29. The robot can be viewed by the public until August 6, said the video notes.

The robot is not designed to be just like a real everyday companion so that might alleviate the creeped-out feeling, once it is understood what the researchers are trying to accomplish.

Dave Gershgorn in *Popular Science* is apparently not surprised that this robot might seem creepy to some viewers. "Maybe it's the spotlight illuminating Alter in a pitch-black room that makes it seem so scary, or the ominous groans of some electronic instrument that are generated when the robot moves its [fingers](#)."

Mat Smith, senior editor, *Engadget*, presented a detailed look at Alter and said it had "a [neural network](#)" enabling it to move and interact alone.

This embedded neural network allows it to move itself. Smith said the robot can create "movement patterns of its own, influenced by sensors that detect proximity, temperature and, for some reason, humidity."

Is this to be taken as a human-like robot? That may be debated. The video shows movements that are not your everyday gestures but rather movements similar to a modern dancer interpreting music with hands and fingers.

In fact, Osaka University's Kouei Ogawa, said in *Engadget* that "This time, Alter doesn't look like a human. It doesn't really move like human. However, it certainly has a presence."

Smith commented that the setup of the robot gives viewers "the very strange sensation that this particular robot is somehow alive. And that's precisely the point."

RT.com described the goals too. "The point of the project was not to move closer to mimicking humans, but to enable robots to 'control' their movements and twitches on their own."

The technology involves 42 pneumatic actuators and a [central pattern generator](#) (CPG).

Simply put, in the words of RT, it is a neural network that "breathes life into the robot's facial muscles, making them react to outside stimuli with the aid of a central pattern [generator](#)."

The theory behind the CPG, said *Engadget*, is based on the Izhikevich neuron, which reacts in a way called spiking and burst behavior: "Something builds up, and the robot's system creates a signal spike, which chains together with other neurons." Professor Ikeue from Tokyo University described the [central pattern generator](#) as 'coupled pendulums'

The [robot](#) will be on display, said *Engadget*, "while the Tokyo and Osaka teams hope interactions will inspire new ideas on what they should teach Alter next."

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APA citation: Embedded tech allows robot to move itself, has own rhythm (2016, August 2) retrieved 26 October 2021 from <https://techxplore.com/news/2016-08-embedded-tech-robot-rhythm.html>

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